VLT Software

X-shooter Instrument Software User and Maintenance Manual

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1 INTRODUCTION

The software described in this manual is intended to be used in the ESO VLT project by ESO and authorized external contractors only.

While every precaution has been taken in the development of the software and in the preparation of this documentation, ESO assumes no responsibility for errors or omissions, or for damage resulting from the use of the software or of the information contained herein.

1.1 Purpose

This document is the User and maintenance Manual of X-shooter Instrument Control Software.
This package is fully based on VLT Instrumentation Common Software packages, such as *icb* (base ICS, see **[RD 16]** and **[RD 26]**), *boss* (base OS, see **[RD 17]**), *tpl* (library for templates, see **[RD 24]**), *pkgin* (installation tool, see **[RD 18]**), *ctoo* (configuration tool, see **[RD 25]**) and *stoo* (startup tool, see **[RD 18]**).

1.2 Scope

This document covers only the control part of the X-shooter Instrument Software. The Instrument Observation Templates are described separately in their Reference Manual (see **[AD 13]**). It does not deal with other parts of the Data Flow, such as the pipeline.
It is aimed at operators of the instrument and software developers, who are responsible for its installation and maintenance.
This document, revised and released after the Commissioning Phase, contains only operational aspects considering the Instrument at the Telescope. It contains also references to the installation and operational aspects at the VCM at ESO-Garching for test purposes.

1.3 Applicable Documents

The following documents, of the exact issue shown, form a part of this document to the extent specified herein. In the event of conflict between the documents referenced herein and the contents of this document, the contents of this document shall be considered as a superseding requirement.

Reference	Document Number	Issue	Date	Title
[AD 01]	GEN-SPE-ESO-19400-0794	3	In preparation	DICB - Data Interface Control Document
[AD 02]	VLT-SPE-ESO-10000-0011	3	In preparation	VLT Software Requirements Specification
[AD 03]	VLT-PRO-ESO-10000-0228	2	In preparation	VLT Software Programming Standards
[AD 04]	VLT-SPE-ESO-10000-2723	0.9	14/09/2004	VLT Requirements for Scientific Instruments
[AD 05]	VLT-MAN-ESO-17210-0667	1.2	08/10/2001	Guidelines for VLT applications.
[AD 06]	VLT-SPE-ESO-17212-0001	5	13/01/2005	INS Software Specification
[AD 07]	VLT-SPE-ESO-17240-0385	4	13/01/2005	INS Common Software Specification
[AD 08]	VLT-ICD-ESO-17240-19400	2.6	17/11/1997	ICD between VCS and Archive
[AD 09]	VLT-ICD-ESO-17240-19200	1.3	07/06/2000	ICD between VCS and OH
[AD 10]	XSH-SPE-ITA-8000-0043	1.1	13/01/2006	Instrument Software Design Description
[AD 11]	XSH-PLA-ITA-8000-0044	1.0	22/08/2008	Instrument Software Acceptance Test Plan
[AD 12]	XSH-PLA-ITA-8000-0050	1.1	30/06/2006	Instrument Software Management Plan
[AD 13]	XSH-MAN-ITA-8000-0031	2.0	22/08/2008	X-shooter Templates Reference Manual

1.4 Reference Documents

The following documents are referenced in this document.

Reference	Document Number	Issue	Date	Title
[RD 01]	VLT-MAN-ESO-17200-0888	1.0	17/08/1995	VLT Common Software Overview
[RD 02]	VLT-MAN-ESO-17200-0642	4	29/04/2004	VLT Common Software Installation Manual
[RD 03]	VLT-SPE-ESO-17100-3439	1	In preparation	Paranal Network/Computers Design Description
[RD 04]	VLT-MAN-SBI-17210-0001	3.7	05/10/2001	LCU Common Software User Manual
[RD 05]	VLT-MAN-ESO-17210-0600	1.7	02/10/1998	Motor Control sw User Manual API/ACI
[RD 06]	VLT-MAN-ESO-17210-0669	1.6	02/10/1998	Motor Engineering Interface User Manual
[RD 07]	VLT-MAN-ESO-17210-0619	2.4	31/03/2004	Central Control Software User Manual
[RD 08]	VLT-MAN-ESO-17210-0707	1.6	30/09/1999	On Line Database Loader User Manual
[RD 09]	VLT-MAN-ESO-17210-0771	1.8	06/10/2001	EVH User Manual
[RD 10]	VLT-MAN-ESO-17210-0770	1.8	30/09/2001	Extended CCS User Manual
[RD 11]	VLT-MAN-ESO-17210-0690	5	31/03/2002	Panel Editor User Manual
[RD 12]	VLT-MAN-ESO-17240-0853	3	26/03/2004	INS Common sw - oslx User Manual
[RD 13]	VLT-MAN-ESO-17240-0672	1.6	25/09/1998	CCD Detectors Control Software User Manual
[RD 14]	VLT-MAN-ESO-13640-1388	3	31/03/2004	FIERA Control Software User Manual
[RD 15]	VLT-MAN-ESO-14100-1878	1.4	01/12/2003	IRACE-DCS User Manual
[RD 16]	VLT-MAN-ESO-17240-0934	5	31/03/2004	Base ICS User Manual
[RD 17]	VLT-MAN-ESO-17240-2265	4	05/04/2004	Base OS Stub User Manual
[RD 18]	VLT-MAN-ESO-17240-1913	4	31/03/2004	Installation Tool for VLT Sw packages
[RD 19]	VLT-MAN-ESO-17240-2153	4	31/03/2004	INS Startup Tool User Manual
[RD 20]	VLT-MAN-ESO-17220-0737	3	28/03/2002	HOS - Sequencer User Manual
[RD 21]	P.Ward, S.Mellor, Yourdon Press,		1985	Structured Development for Real-Time Systems
[RD 22]	J. Rumbaugh et. al., Prentice Hall,		1991	Object-Oriented Modeling and Design
[RD 23]	VLT-MAN-ESO-17220-1999	4	19/04/2004	Broker for Observation Blocks User Manual
[RD 24]	VLT-MAN-ESO-17240-2240	4	31/03/2004	INS Common Software for Templates
[RD 25]	VLT-MAN-ESO-17240-2325	4	31/03/2004	INS Configuration tool User Manual
[RD 26]	VLT-MAN-ESO-17240-2606	3	31/03/2004	Base ICS GUI User Manual
[RD 27]	VLT-PLA-ESO-17240-2266	5	13/01/2005	Acceptance Test Plan Template Document
[RD 28]	VLT-MAN-ESO-17200-0908	1.4	15/02/2001	Tool for Automated Testing User Manual
[RD 29]	XSH-TRE-ESO-6000-0106	0.1	28/09/2005	Optical Detector Control Sw Performance Analysis

1.5 Abbreviations and Acronyms

This document employs several abbreviations and acronyms to refer concisely to an item, after it has been introduced. The following list is aimed to help the reader in recalling the extended meaning of each short expression:

A&G	Acquisition & Guiding
AFC	Automatic Flexure Compensation
CCS	Central Control Software
CPU	Central Processing Unit
DCS	Detector Control Software
ESO	European Southern Observatory
FITS	Flexible Image Transport Format
GUI	Graphical User Interface
HW	Hardware
ICS	Instrument Control Software
INS	Instrumentation Software Package
I/O	Input/output
IWS	Instrument Workstation
LAN	Local Area Network
LCC	LCU Common Software
LCU	Local Control Unit
MS	Maintenance Software
N/A	Not Applicable
OMT	Object Modeling Technique
OO	Object Oriented
OOD	Object Oriented Design
OS	Observation Software
RAM	Random Access Memory
SW	Software
TAT	Tool for Automated Testing
TBC	To Be Clarified
TBD	To Be Defined
TCS	Telescope Control Software
TIM	Time Interface Module
TRS	Time Reference System
UIF	(Portable) User Interface (Toolkit)
UT2	VLT Unit Telescope no. 2
VLT	Very Large Telescope
VCM	Virtual Control Model
VME	Versa Module Eurocard
WS	Workstation

1.6 Glossary

No special definition is introduced in this manual

1.7 Stylistic Conventions

The following styles are used:

bold
: in the text, for commands, filenames, pre/suffixes as they have to be typed.

italic
: in the text, for parts that have to be substituted with the real content before typing.

`teletype`
: for examples.

<name>
: in the examples, for parts that have to be substituted with the real content before typing.

bold and *italic* are also used to highlight words.

1.7.1 Data Flow and Processor Model Diagrams

Data Flow and processor Model Diagrams are based on De Marco/Yourdon notation for real-time systems **[RD 20]**.

1.8 Naming Conventions

This implementation follows the naming conventions as outlined in **[AD 03]**.

1.9 Problem Reporting/Change Request

The form described in **[RD 02]** shall be used.

2 OVERVIEW

X-shooter is a wide band (U to K) single object spectrograph for the VLT. The optimization is achieved splitting the beam into three arms, dedicated to the UV-Blue, Visible and Near-Infrared bands. It operates at intermediate resolution (R = 4000 ï 14000) and will be installed at the Cassegrain focus of UT2. A great effort has been spent to limit its weight. A result that affects the Instrument Software is the use, for the first time, of a single FIERA controller for the two UVB and VIS arms. This will be discussed later in this document. Another outstanding aspect of the instrument is the flexure control and compensation. This is achieved with the use of three tilt mirrors, placed along the three beams and controlled by piezos. This system will be illustrated and its control aspects explained in the following chapters.

This chapter gives a short overview of the instrument and its architecture.
The rest of the manual is organized as follows:

- Chapter 3 is the installation guide.
- Chapter 4 is the operatorôs guide, which describes how to operate the instrument at various levels.
- Chapter 5 is the programmerôs guide, which describes in detail specific items, such as ICS devices and commands.
- Chapter 6 is the configuration guide, which describes in detail the configuration of the instrument.
- Chapter 7 contains a FAQ and troubleshooting tips specific to the instrument
- Chapter 9 contains the details of the X-shooter specific configuration files.

2.1 Hardware architecture

2.1.1 Devices

The Instrument consists of:

- 29 devices, controlled by ICS, on 2 LCUs:
  - 13 motorized
  - 6 calibration lamps
  - 7 sensor devices
  - 3 piezo systems
- 3 scientific detectors
  - 1 infrared (IRACE controller)
  - 2 optical (only one FIERA controller)
- 1 technical CCD camera (NG controller)

2.1.2 Computers

The computers on which the Instrument Software runs are shown in Figure 1:

- Instrument Workstation (node : wshoot)
- ICS LCU 1 (node : lshics1) ï controls all the motorized functions
- ICS LCU 2 (node : lshics2) ï controls all sensor devices, lamps and AFCs
- TCCD LCU (node : lshtccd)
- IRACE UltraSparc (node : wshnir)
- FIERA UltraSparc (node : wshubv)

2.1.3 LANs

The Instrument LAN follows the lay-out of VLT Control LANs (see **[RD 03]**) and is shown in Figure 1

2.1.4 Special connections

The instrument architecture does not foresee any special connection.

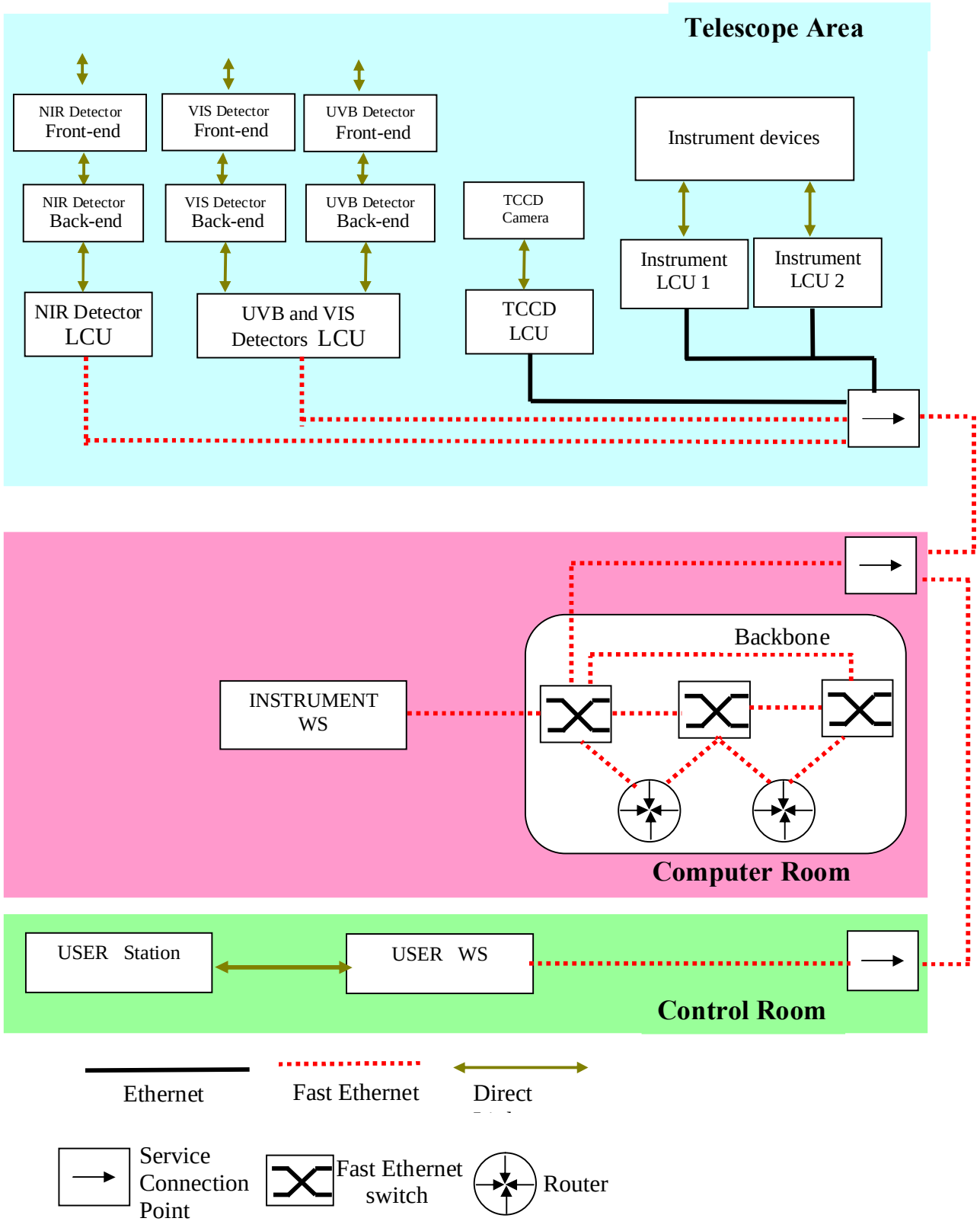

Figure 1 Hardware architecture

2.2 Software Architecture

The architecture of the Control Software follows the VLT standard operational scheme and is shown in Figure 2

2.2.1 Software Modules

The *X-shooter* Instrument Software consists of the following *cmm* modules (the prefix id *sh* corresponds to the Instrument ID):

Name	INS Module	Platform	Description
shins	N/A	WS	Installation module for the final target configuration
dicSHOOT	N/A	WS	FITS dictionaries
shi	ICS	WS	ICS WS front-end and LCU simulator
shipan	ICS	WS	ICS stand-alone GUI
shipzt	ICS	LCU	ICS AFCS piezo control special device
shibal	ICS	WS	Balzers/Pfeiffer pressure sensor control special device
fcdshdetb	DCS	WS	UVB Fiera detector configuration module
fcdshdetv	DCS	WS	VIS Fiera detector configuration module
shnir	DCS	WS	NIR Irace detector configuration module
shdnir	DCS	WS	NIR Irace detector customized Data Transfer Task
sho	OS	WS	OS Server
shortd	OS	WS	Rtd GUI for A&G acquisition
shopan	OS	WS	OS GUI
shoseq	OS	WS	Observation Template scripts
shotsf	OS	WS	Observation Template Signature Files
shmcfg	MS	WS	Instrument Configuration Files
shmseq	MS	WS	Maintenance Template scripts
shmtsf	MS	WS	Maintenance Template Signature Files

At ESO-Garching the following *cmm* module is also used:

Name	Location	Platform	Description
shmgar	ESO Garching	WS	Installation and configuration module for installation and test purposes at VCM operated at ESO Garching

2.2.2 Environments

The Instrument sw defines and creates the following CCS environments:

- *wshoot*. IWS CCS environment (see *RTAPENV*)
- *lshics1*. ICS LCU1 LCC environment.
- *lshics2*. ICS LCU2 LCC environment.
- *lshtccd*. TCCD DCS LCC environment.
- *wshubv*. FIERA DCS CCS environment for UVB and VIS detectors

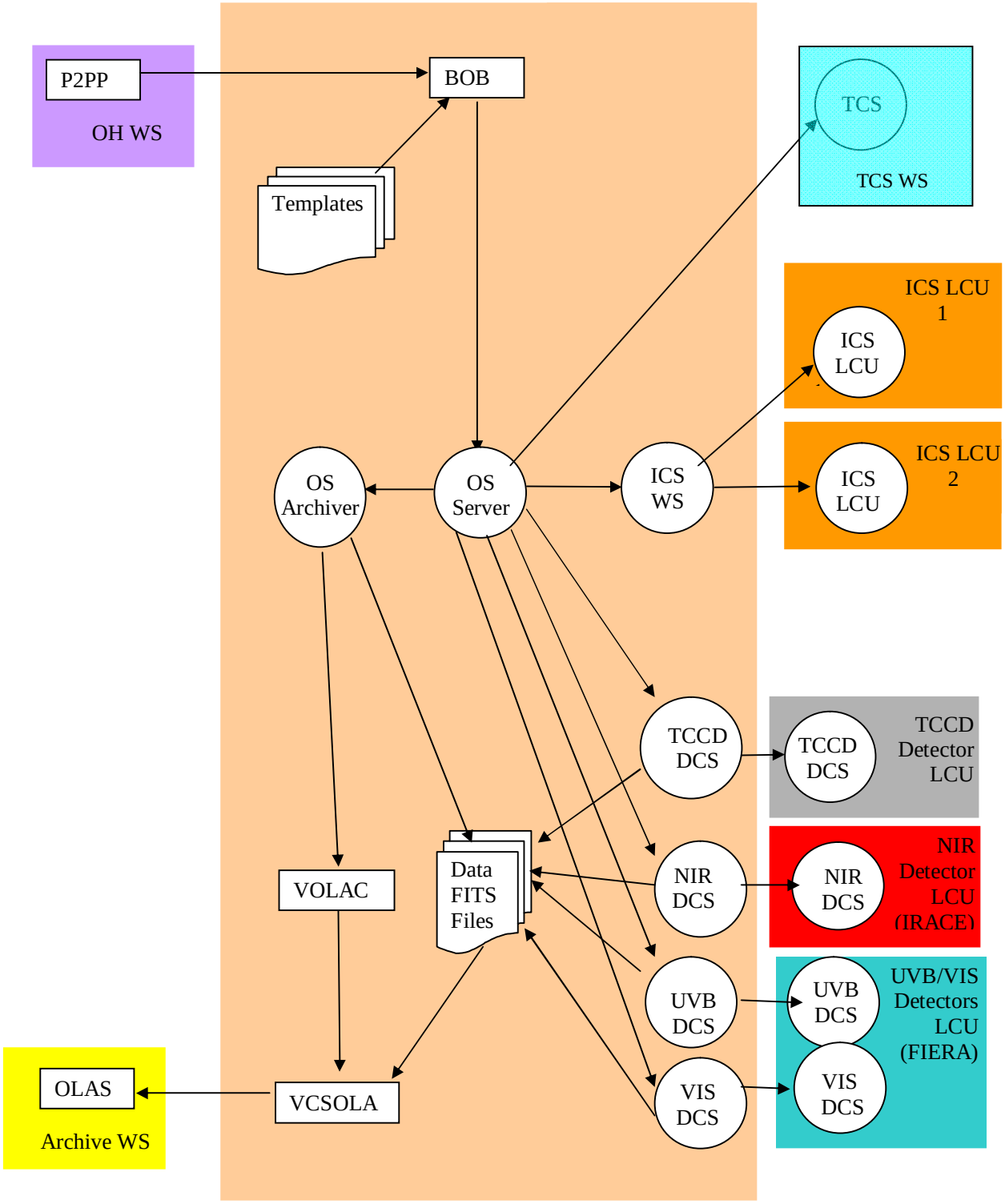

Figure 2 X-shooter software Architecture

2.2.3 Users

Two user accounts exist on the Instrument Workstation

- shootmgr
- shoot

As described below, all the installation procedures must be run as user <*shootmgr*>, while the Operations (start-up, shut-down, observations) are to be run as user <*shoot*>.

2.2.4 Standards

The Instrument Software is based on the standard packages distributed with VLT Software releases. In particular:

- TCCD DCS is based on the CCD Software (see **[RD 13]**).
- IR DCS is based on the IRACE Software (see **[RD 15]**).
- FIERA is based on the FIERA Software (see **[RD 14]**).
- ICS is based on the *icb* package (see **[RD 16]** and **[RD 26]**).
- OS is based on the *BOSS* package (see **[RD 17]**).
- Templates are based on the *tpl* package (see **[RD 24]**).
- The Instrument Software installation is based on the pkgin package (see **[RD 18]**).
- The Instrument Configuration is based on the *ctoo* package (see **[RD 25]**) .
- The Instrument Software Start-up/Shutdown is based on the *stoo* package (see **[RD 19]**).

3 INSTALLATION GUIDE

The installation uses the VLT standard tool *pkgin* (see **[RD 17]**).

3.1 Requirements

3.1.1 Hardware

The following computers must be available (see section 2.1.2):

- One Instrument Workstation, Linux WS, model supported by the VLT sw, see **[RD 02]**).

To achieve the complete functionality also the following computers must be available:

- Two LCUs for ICS
- One LCU for the TCCD
- One Linux WS for IRACE
- One Sparc LCU for FIERA

If some of them are not available the Instrument software must be configured to run in partial simulation.

3.1.2 Software

- The Scientific Linux distribution is installed and running on the IWS, following the VLT standard installation (see **[RD 02]**). The 2.6.9-34 release of the kernel is running during the commissioning.
- The VLTSW FEB2008 is installed as target release for the acceptance and commissioning, according to **[RD 02]**.
- SHOOT runs on *CCSLite*.

3.2 Installation procedure

The whole installation procedure must be executed as user *shootmgr*. It consists of the following steps:

I. Installation preparation

1.) Run the utility *vccEnv* and verify that the following CCS environments are known and correctly configured in the ACC database:
wshoot for the instrument
lshics1 for ICS LCU 1
lshics2 for ICS LCU 2
lshtccd for TCCD DCS LCU
wshubv for the FIERA SLCU

2.) Verify that the environment variables *INTROOT* and *INS_ROOT* are defined.
% echo $INTROOT
% echo $INS_ROOT

3.) Verify that the file $HOME/.bobrc exists and is a symbolic link to $INTROOT/config/shins.bobrc. If not, run:
% ln ï s $INTROOT/config/shins.bobrc $HOME/.bobrc

4.) Create an empty directory as root for the source code, e.g.:
% mkdir $HOME/SHOOT

5.) Retrieve the installation module:
% cd $HOME/SHOOT
a) For the target installation (at Paranal) :
% cmmCopy ***shins*** [<version>]
b) For the VCM installation (at ESO-Garching) :
- Define the environment variable TARGET=CM_FULL

% cmmCopy ***shmgar*** [<version>]

II. Installation

6.) Build and install the Instrument Software

At Paranal:
a) % pkginBuild shins -step CLEAN
b) % pkginBuild shins

or
at ESO-Garching/VCM
a) % pkginBuild shmgar -step CLEAN
b) % pkginBuild shmgar

Run points (a) and (b) if the previous installation must be removed. Run only point (b) if it is a new installation or an upgrade of a previous one (i.e. INTROOT and INS_ROOT do not need to be removed).

During the installation the following directories are created:

INSTALL	It contains logs and error logs of the installation.
ICS	It contains all ICS modules (see 2.2.1)
DCS	It contains all detector configuration modules (see 2.2.1)
OS	It contains all OS modules (see 2.2.1)
MS	It contains all MS modules (see 2.2.1), in particular *shmcfg*, with the whole set of configuration files.
VLTSW_new	It contains an upgraded version of modules, if any, belonging to VLT sw releases. If all modules as from VLTROOT are taken, this directory is missing.
COMMON	It contains ESO sw modules not officially belonging to the VLT software (e.g. the CLIP suite)

c) At the end of the installation, check for error logs in file $HOME/SHOOT/INSTALL/pkginBuild.err.

Detector installation

During the installation all the instrument software is built. Some hooks, present in the configuration files, provide a way to build also the detectorsô software, i.e. FIERA and IRACE code.

- CLEAN phase
  - cleaning of FIERA WS INTROOT — normally commented out
  - cleaning of IRACE INTROOT and INS_ROOT — normally commented out
- BUILD_MOD phase
  - Re-building of FIERA software — normally commented out
  - Re-building of IRACE software
- BUILD_ENV phase:
  - Creation of FIERA WS environment
- START_LCUENV phase
  - Start of FIERA WS environment

As specified above, normally the FIERA and IRACE sw are built separately, on the detectorôs WS, and there is not the need to build it every time the instrument sw is re-built. If a complete installation is needed, uncomment the relative hooks in the file *shins/config/shinsINSTALL.cfg*.

4 OPERATOR'S GUIDE

This chapter is intended to give instrument operators all information they need to work with the Instrument Control Software through its Graphical User Interface.

For Instruments operational at Paranal, after proper log-in on the User Station, the CDE menu is customized to the specific Instrument to be operated, such that dedicated options to start-up/shutdown control processes or individual panels are provided. The set-up of the CDE menus is under responsibility of Paranal staff.

4.1 Environment Start-up and Shut-down

The Environments are created and started during the Installation phase (see chapter 3). If, for any reason, the environments are to be shut-down and restarted, do as follows:

As user *shootmgr*, type from a shell:

% cd ~/SHOOT

At Paranal:
% shinsStartEnv
% shinsStoptEnv

or

at ESO-Garching/VCM:
- use the local installation module shmgar
- define the environment variable TARGET=CM_FULL

% shmgarStartEnv
% shmgarStopEnv

The above commands have been implemented to provide simple commands for the User/Operator and are wrappers calling the VLT command *pkginBuild* with the proper arguments. In particular, the commands to start the environments will start all the WS environments, all the LCU environment and will install and check the scan links among them.

4.2 Instrument Software Start-up

In the following it is assumed that the installation (see chapter 3) has been successfully completed and environments are active.

4.2.1 Log-in

In order to operate the instrument properly, the user has to **log-in on all terminals** on the User Station as user *shoot.*
Unless otherwise specified, **all UNIX shell commands**, described in the next sections**, have to be typed on a *xterm* window running on the Instrument Workstation**.
After log-in, check that the environment variables needed to run properly the Instrument software are defined. To list the environment variables that should be defined type:

% osbEnvSet SHOOT

The setting of these variables is done within the file $INTROOT/config/shins-misc-all.env. This file is automatically sourced whenever you log-in or any new *xterm* is opened. Make sure that this is the case.

4.2.2 Telescope availability

If TCS is supposed to be used, check with the telescope operator that it is running and ONLINE, before starting the Instrumentation Software.

4.2.3 Instrument Software Start-up

The system start-up is based on the common startup tool *stoo* (see **[RD 19]**).
After a new installation, or whenever some start-up configuration parameter needs to be changed, type on an *xterm* window:

% **shinsStartup**

The Start-up GUI (see Figure 3) pops-up. This panel allows defining which sub-systems are available and at which level of simulation they should start, in particular if they have to access the LCUs or they should simulate the LCUs functionality at WS level. It also allows specifying which GUIs will be automatically started.

Finally, by pressing the button ***Start***, all specified GUIs and sub-systems control processes are started. A log window shows the various phases of the startup procedure.
When successfully completed, the log window disappears and all sub-systems should be in state *STANDBY*.
If any error occurs, the log window remains active and shows the reason of the failure.

Normally, once the start-up configuration is defined, the instrument can be started, or re-started, by directly typing on an *xterm* window:

% **shinsStart**

This command has the same effect of pressing the *Start* button in the start-up GUI.

4.2.4 Begin of operations

Before being able to operate the instrument and take exposures, it has to be ONLINE.

On the OS Control panel (see Figure 4**):**

- **Check the global State**. If it is not ONLINE, select the menu option

  Instrument → ONLINE.
  Please wait till the global State turns to ONLINE.
- **Check the Telescope**. According to if it is a night or day-session connect/disconnect the Telescope to the Instrument

  Telescope → Use Telescope
  → Ignore Telescope
  When passing from night to day session or vice versa OS will change the link to the Telescope and will stay in the STANDBY mode. Follow previous item instructions to put the Instrument ONLINE.
- **Check the Instrument Shutter**. According to if it is a night or day-session open/close the Instrument Shutter.

  Instrument → Open Instrument Shutter
  →Close Instrument Shutter
  Note then when the Instrument sw goes into STANDBY state, the Instrument Shutter is automatically closed.

4.3 Instrument Software Shut-down

4.3.1 End of operations

After operating the instrument, whenever it is foreseen to leave it idle for long time (e.g. during daytime), the instrument has to be brought to a safe state, also called STANDBY.

On the OS Control panel (see Figure 4**):**

- Instrument → Close Instrument Shutter
- Telescope → Ignore Telescope
- Instrument → STANDBY
  Wait till the global State turns to STANDBY.
  Note then when the Instrument sw goes into STANDBY state, the Instrument Shutter is automatically closed.

4.3.2 Instrument processes shut-down

To shut-down all the instrument control processes, type on a *xterm* window:

% **shinsStop**

All control processes and panels are terminated.

4.4 User interactions during operations

Various sections of the Instrument Operations during instrument start-up/shut-down or Observations are performed automatically or may require manual intervention In some cases an interactive selection/confirmation by the User/Observer is required. They are explained in the following sections.

- FIERA detectors startup/shutdown constraints
- Automatic Flexure Compensation procedures
- Camera focus during observations
- Interactive target acquisition

4.4.1 FIERA operational constraints

The two optical detectors UVB and VIS share the same SLCU and the same electronics. To enable independent operations on the two arms, a software concept of two cameras is used. Each camera controls one detector head together with its associated shutter. This configuration allows an independent control of the shutters through separate PULPOs while sharing the same FIERA controller but introduces dependencies on the order of operations on the two detectors (see **[RD 29]**).

During normal operations, the following constraints apply on the startup/shutdown procedures of the two detectors controlled by FIERA:

1. ***Both cameras are off***
   To startup the two cameras the UVB must be started first and only when ONLINE can the VIS camera be started
2. ***Both cameras are ONLINE***
   To shutdown the two cameras the VIS must be shut down first and then the UVB
3. ***Both cameras are off***
   The start-up any of the two cameras, leaving the other down, can be done always, regardless of the camera
4. ***One camera is already up, the other has to be enabled***
   This is no problem if the on-line camera is the UVB, the VIS camera may be simply started; otherwise, if the on-line camera is the VIS then it must be first shut down and then the procedure (1) above can be followed
5. ***Both cameras are up***
   Shutting down one camera will kill some processes which are shared by the other; therefore both cameras must first be shut down (following the case 2) and then the one required restarted.

6. ***Moreover, if one of the two cameras is in simulation mode, at the start-up the one in normal mode must be started first, so it can load all the correct parameters.***

To reduce the detector electronic noise, it has been decided not to startup/shutdown the detectors at any time with the instrument software. The Instrument software startup/shutdown will therefore leave untouched the FIERA control software, that will be sent only to STANDBY/ONLINE states. This is achieved by use of a dedicated configuration keyword

OCS.DET1/2.STOP F

placed in the instrument configuration file (see section 9.2.2).
If, for any reason, a FIERA detector has to be shut-down (and re-started later) the engineering panel must be used (see Figure 13) and the recommendations described in the points 1-6 above must be manually followed. Be sure to place both detectors ON or OFF before issuing the standard commands <*shinsStart/shinsStop*>.

During a <*shinsStart*> operation, if both the detectors are off, they are re-started following the recommendations described in the points 1-6 above. This task is accomplished by a customized version of the start-up tool, that takes care of the starting order of the detectors.

4.4.2 Automatic Flexure Compensation – AFC

The Automatic Flexure Compensation (AFC) sub-system consists basically in a set of three tilt-mirrors, controlled by three piezos, that have the task to control the deviations of the light beams due to the possible flexure of the spectrographs arms wrt the instrument backbone, keeping them always aligned with the slit entrances.
The AFC sub-system is handled by the high level software in the following way:
A first set of exposures is taken with the three arms and the NIR calibration spectral lamp LAMP2. The system setup is

- A&G slide : SLOT

- Spectrograph arms slit : Pin_0.5

A second set of three exposures is taken with the setup

- A&G slide : PIN
- Spectrograph arms slit : 5.0x11

A Cross-Correlation function is called (via CLIP) to compute the displacement of selected reference lines between the two exposure sets. The result, (converted to voltage) is applied to the tilting mirrors controlling the three beams. All the voltage levels are referred to a central position level (PARK ï see section 6.2.1). The operation may be repeated (according to operator decision) to reach a good level of correction. After this initial correction the three sub-systems are set to AUTO mode, and continue to correct, according to a pre-defined formula. This automatic correction has a limited validity in time (~1 hour) and for this reason the time when the first computed correction is applied is shown to the User in the OS Control panel (see section 4.5.2 and Figure 4.

In order to minimize time losses, the whole procedure described above is run, as a rule, in the Acquisition Template after the Telescope preset, during the time spent by the Operator to set-up the Active Optics and the Auto-Guiding.
An independent template, running only the AFC procedure, is available from the Observation Templates set to be inserted in a complex OB in case the total exposure time is longer than the validity time of the initial correction.

At the end of the computation the results are shown to the User with a pop-up panel, offering the possibility to

- Confirm, apply the result and continue the operations
- Apply the result and re-do the second set of exposure to achieve a better correction
- Continue the operations without applying the corrections

The AFC procedure is driven by a set of configuration files (one for each instrument arm ï see section 6.2.1) defining:

- The list of (x,y) coordinates to identify the reference lines in the spectra to be compared
- The coefficients for the pixel-to-voltage conversion formula.

The max-distance and window-size parameters of the cross-correlation procedure are defined (at least during the commissioning phase, tbd) by the User from P2PP.

The parameters needed by the whole AFC procedure are defined in three configuration files:

- *shmcfgAFCRef_UVB.cfg*
- *shmcfgAFCRef_VIS.cfg*
- *shmcfgAFCRef_NIR.cfg*

The configuration keywords are detailed in sections 6.2.1, 9.2.5, 9.2.6, and 9.2.7.
The low-level implementation of the AFC mechanism is described in section 5.4.1.

4.4.3 Camera focus procedures

The optical cameras UVB and VIS are provided with motorized functions to adjust the focus according to the current temperature. As a result of the tests it was observed that the VIS camera is insensitive to the temperature. The corresponding VIS focus motor is maintained therefore in stationary position.
The control and re-focusing are implemented in the templates and enforced in an automatic way during the instrument setup before every exposure. If the focus value to be applied is not valid (wrong temperature acquisition) then an interactive recovery procedure is proposed to the User.

- The current temperature is evaluated as the median of the last 20 temperature readings.
- If, for any reason, the temperature reading mechanism fails, a <*last good temperature*> value is maintained and proposed to the User via a pop-up panel, together with the time it was acquired. If the User confirms this value the re-focus is applied and the operations proceed.
- If the <*last good temperature*> value is not accepted by the User then
- the User is prompted to insert a valid temperature value. The re-focus is applied and the operations proceed.

4.4.4 Interactive target acquisition

At the end of the acquisition template the User is prompted (by a message and an acoustic signal) to select the observation target, i.e. to put it in the center of the slits. The A&G GUI appears (see Figure 8) and the User must pick-up the target with the mouse. The offset from center slit is computed and the result is shown to the User in a pop-up window. The choices are:

- Apply and Continue

the offset is applied to the telescope and the acquisition template proceeds

- Apply and Re-do
  The offset is applied to the telescope and a new target selection is proposed
- Continue
  The template proceeds without applying any offset to the telescope.

With the A&G GUI active the User has also the possibility to activate from the Menu bar a sub-panel to apply small offsets to the telescope or to apply a rotation to the Adapter./Rotator (see Figure 10).

At the same time, with the field displayed in the main window of the A&G panel an additional graphical tool may be started from the Menu bar to select a target, set-up some parameters and get a rough estimation of the object magnitude (see Figure 11). This value may be used to modify the Exposure Time in the future Observation Templates.

4.5 Instrument GUI

Some of the Instrument sub-systems offer a VLT standard GUI, e.g. the FIERA (see **[RD 14]**), the IRACE (see **[RD 15]**) and the TCCD (see **[RD 13]**) stand-alone control panels. The Instrument specific GUI includes the following panels:

- Observation GUI
  - Startup panel
  - OS Control panel
  - Instrument Full Status panel
  - Sensor Plot
  - A&G Control panels
- Engineering GUI
  - ICS Control panel
  - OS Engineering Control panel

4.5.1 Startup panel

This panel is provided by the standard VLTSW package stoo, and provides an interactive interface to the keywords contained in the Configuration files (i.e. shmcfgSTART.cfg). It allows to modify the availability of the Instrument sub-systems and their Simulation Mode. At the end the Instrument software can be started via the START button.
This panel is to be used the first time the sw is started or when the instrument configuration (availability and/or simulation modes) is changed. For normal operations use the command *<shinsStart>* (see section 4.2).
Command : % shinsStartup

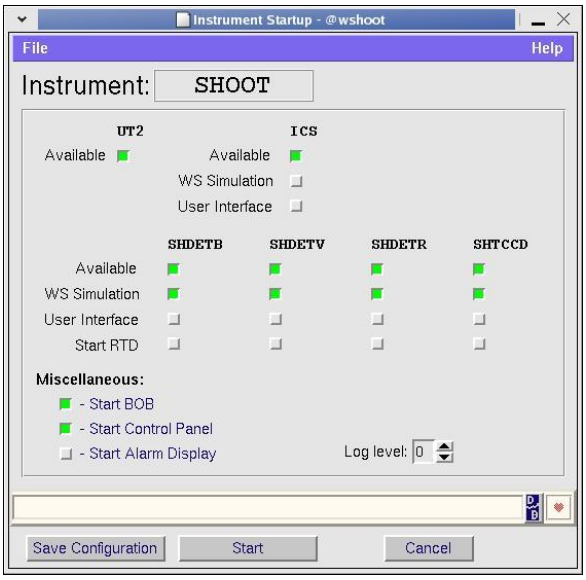

Figure 3 Instrument Startup panel

4.5.2 OS Control panel

It is the main Observation Control panel (see Figure 4, which refers to a simulated status). In its top section it provides the User with the global state of the Instrument and of its sub-systems and it shows the current Instrument Mode. In the central section it displays a detailed status of the detectors. The User is allowed only to End or Abort a running exposure. The Start of an exposure is always controlled by the Templates, via BOB. Its right section displays a summary of the Instrument Alarms (the status of the LEDs are the logical OR of the corresponding alarms in the Full Status panel, see 4.5.3) and the status of the Instrument devices that are relevant to the User. At the bottom, a detailed status of the AFC sub-system is shown. It includes the correction computed at the time the cross-correlation was run and the current values of the extrapolated correction. Since the validity of the extrapolation of the piezos tilt is limited in time, the time of the last computed values is also shown. Three LEDs shows the validity of the last Flexure correction.
The Menu bar Instrument options provide tools to Startup/Shutdown the OS process, to modify the state of the Instrument (STANDBY/ONLINE), to control of the Instrument shutter and to control the link with the Telescope.
Panel type: Observation
Command : % shinsStart ï panel OS_CONTROL

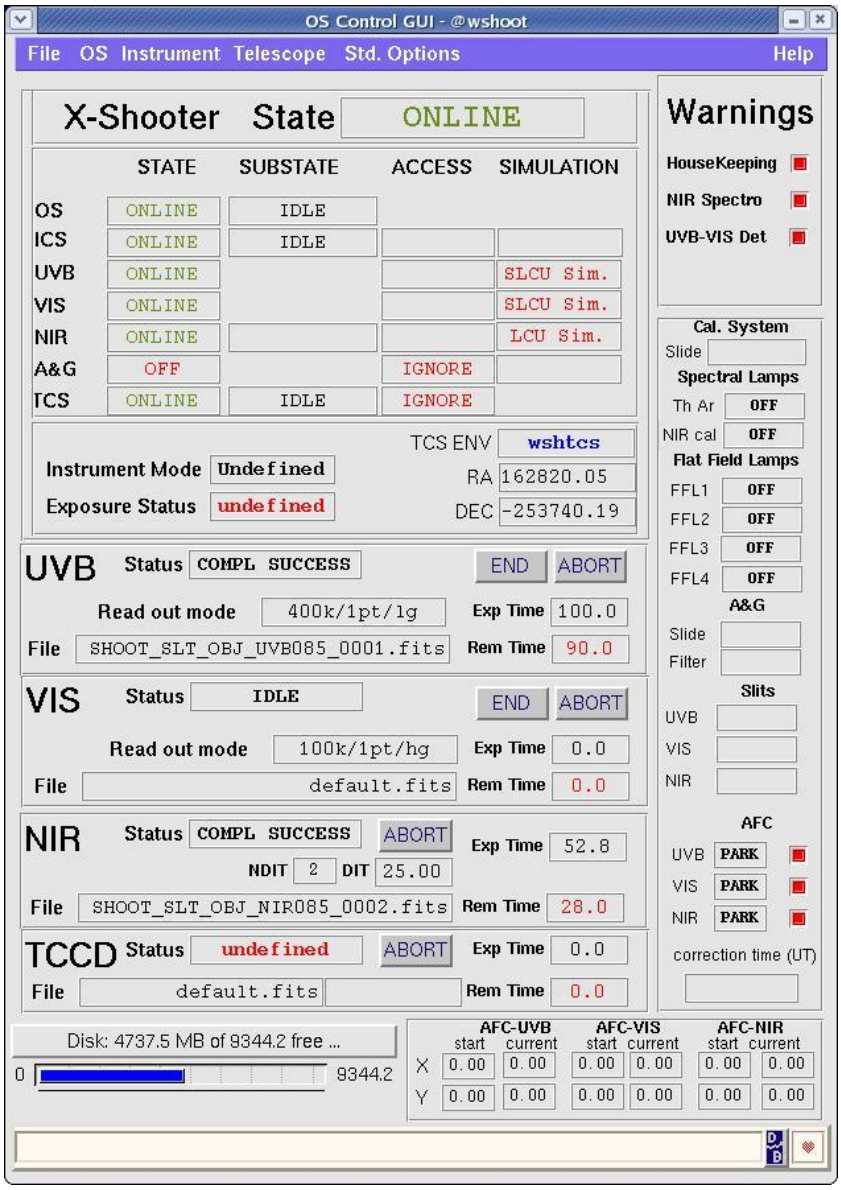

Figure 4 OS Control panel

4.5.3 Instrument Full Status panel

This panel (see Figure 5) displays the status of the whole Instrument, prompting the User with Alarm LEDs, where applicable. The only interactive control on it is the control of the Instrument Shutter. From the Menu bar it is possible to start the Sensor Plot panel (see Figure 6).

Panel type: Observation
Command : % shinsStart –panel OS_STATUS

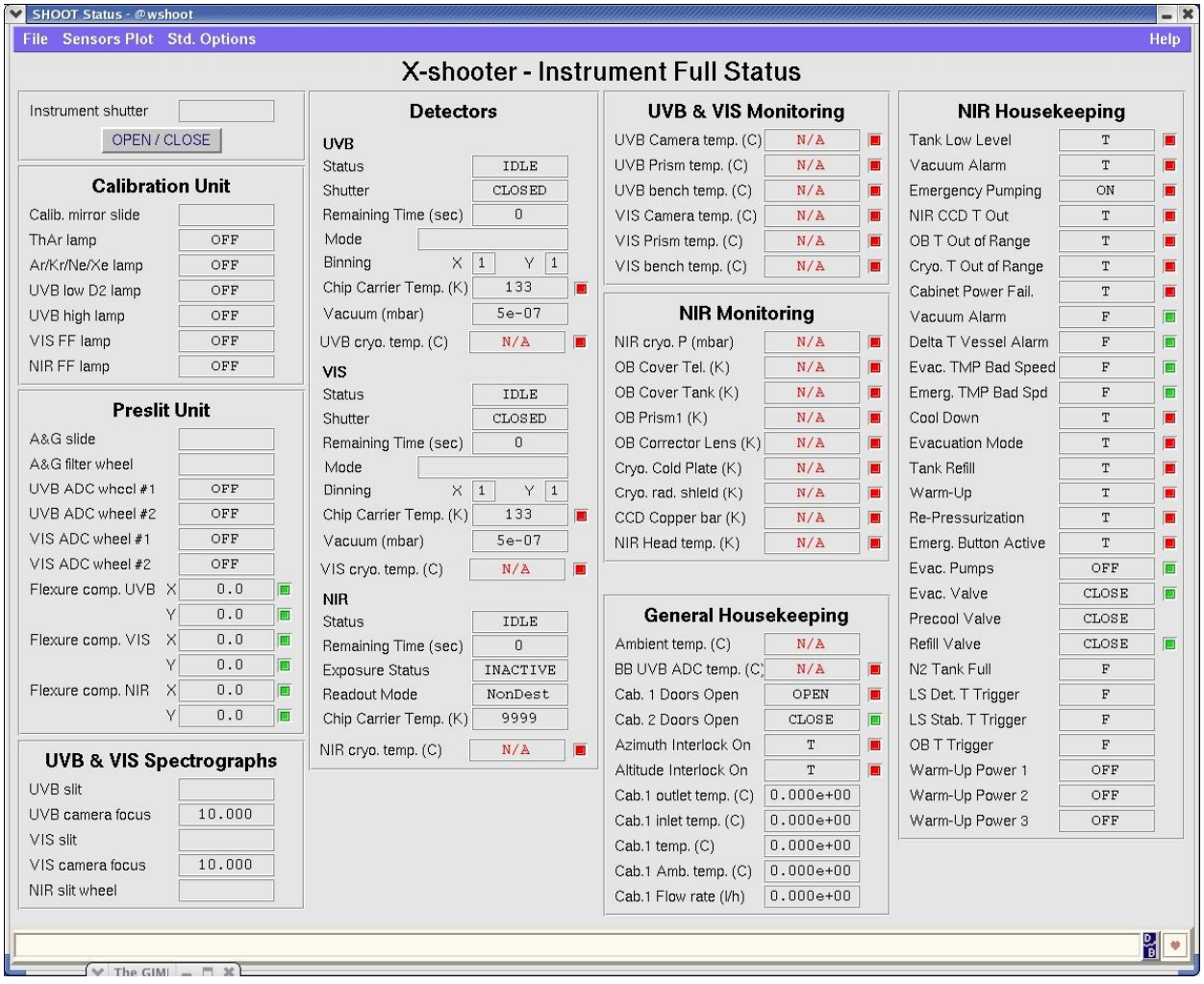

Figure 5 Instrument Full Status panel

The Xshooter OS Status panel is created dynamically on-the-fly by reading sensors description and dedicated configuration keywords from the *shmcfgINS.cfg* file (see section 6.2.4). It follows the same principles as *icbpan*. The configuration keywords are read during the panel startup and according to their value, the OS Status panel is built. This design proved to be very flexible. Reading everything from a common place allowed to reflects immediately any change without touching any line of code.
A detailed description of how things are implemented is described in the man pages of module *shopan*. See also section 4.7.

4.5.4 Sensor Plot panel

This panel (see Figure 6) allows the User to display the plot of a selected sensor vs. time (see Figure 7). All the sensors are selectable.
Panel type: Engineering.
Command : % shinsStart –panel SENSORS_PLOT

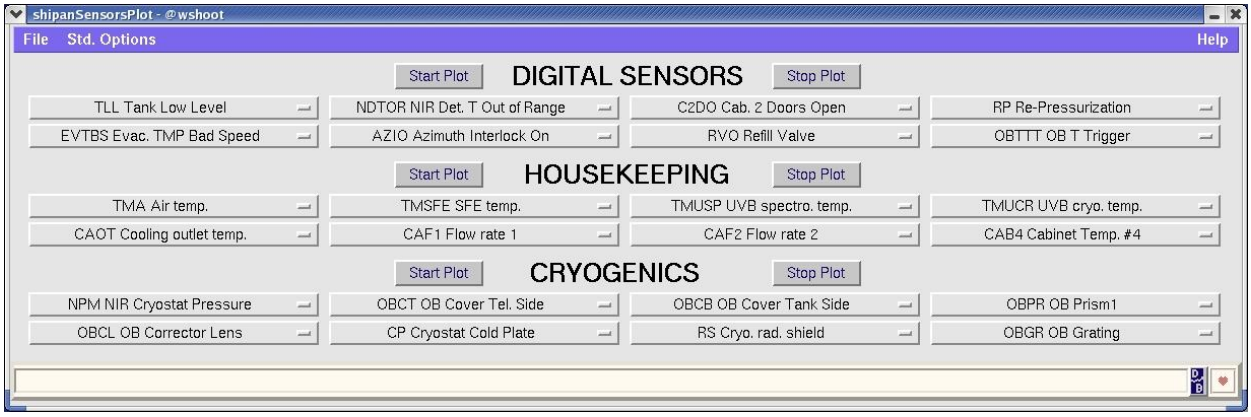

Figure 6 Sensors Plot panel

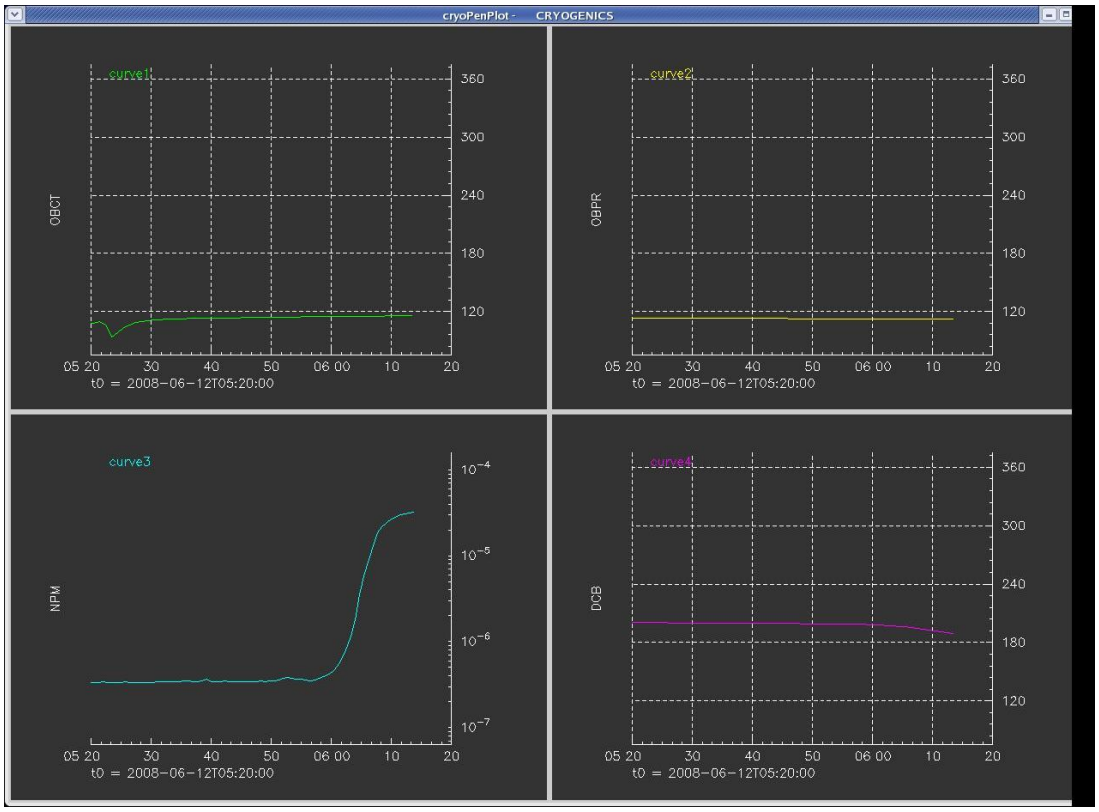

Figure 7 An example of four simultaneous sensors plots

4.5.5 A&G Control panels

The A&G Control set of Panels (*shortd*) are intended to provide an interactive tool to the user during the acquisition phase, to assist the operator in placing the object on the center of the slit or of the IFU**.** Please note that while the sub-system is thoroughly named as *Acquisition and Guiding* only the acquisition functionality is currently defined and implemented.

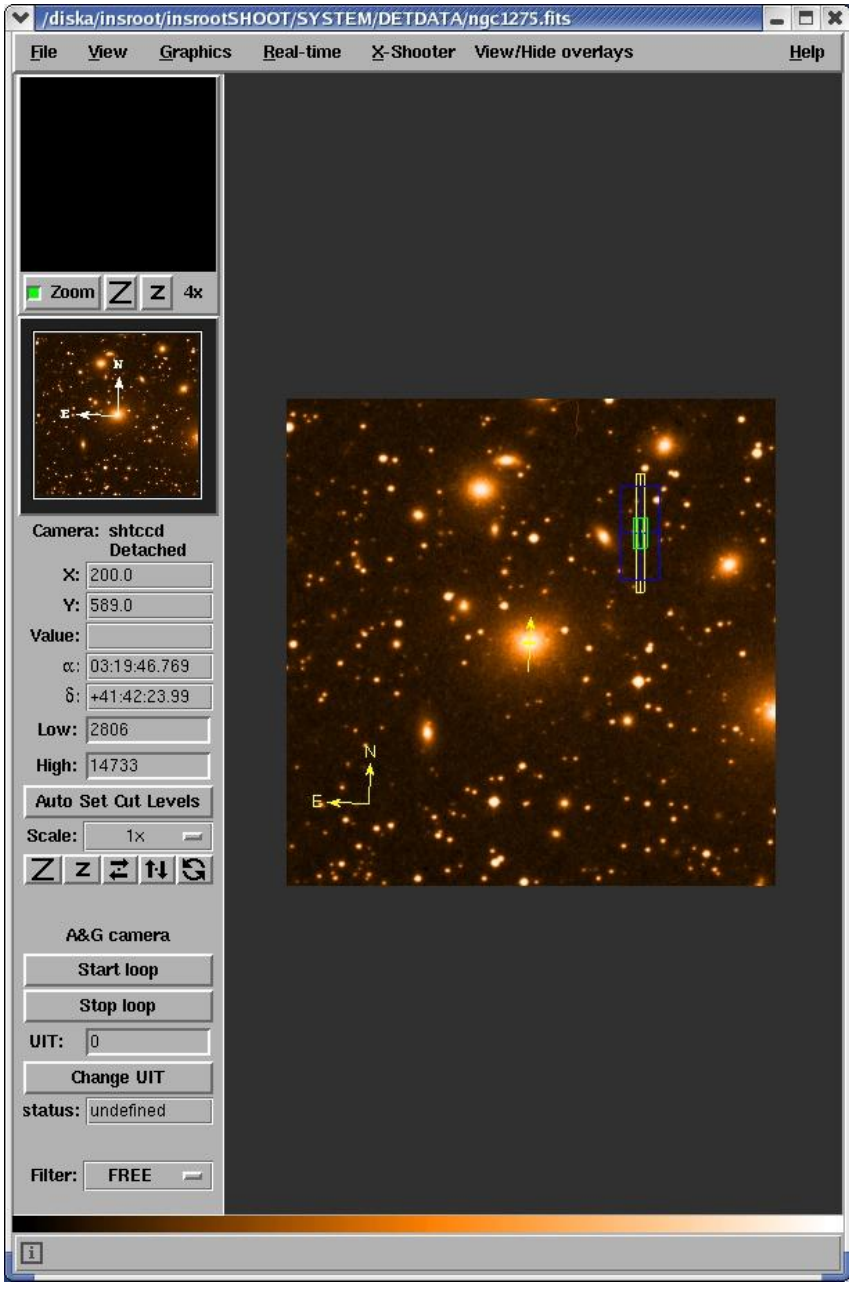

Figure 8 A&G Acquisition panel

Panel type: Observation
Command : % shinsStart –panel AG_CONTROL

The main panel, inherited from *rtd,* provides to the User a tool to handle the Target Acquisition phase (menu *X-Shooter > Pick Object*), to display various overlays indicating N and E directions, the positions of the slits and of the IFU, the atmospheric dispersion spectrum (menu *View/Hide overlays*) and to allow the setup of the A&G camera. From the menu *X-shooter > Evaluate magnitude* a sub-panel could be launched to allow a rough magnitude estimate of the selected object; the menu *Xshooter > Telescope offset* pop-ups instead a sub-panel for offsetting the telescope in X and Y direction (unit arcsec) and for modifying the rotator angle.

The look&feel of the *AG_CONTROL* panel is built following the design principles of *osrtdb*. A set of configuration keywords and files (see module *shortd/config and* section 6.2.4) create additional buttons and output widgets used to send command to and display results from the TCCD (start continuous loop, stop it, change integration time) and to ICS (change A&G filter). All the rest is standard. Two additional menus (always defined in the *shortd/config* , *Xshooter* and *View/Hide overlays*) were moreover added to launch specific Xshooter sub-panels and to plot several features on the main display window.
The overlays that can be plotted are the following (see section 6.2.4 for the definition of the configuration keywords):

- Instrument slits and their appearance (each Xshooter slit has this set defined but only few of them are displayed);
- Instrument IFU and its appearance;
- N/E arrows;
- Atmospheric dispersion direction; the atmospheric dispersion direction is shown by an arrow. Perpendicular to the arrow, three additional segments are shown, with red, green and blue color. Their separation represent the amount of the atmospheric dispersion for the central wavelength of the three arms (B=405 nm, V=633 nm, IR=1310 nm) respect to the central wavelength of the chosen A&G filter.

All the drawings are attached to OLDB and image events. Every time a new image is displayed all the positions for the drawings are recomputed. In particular, depending on the chosen A&G filter, every slit is displaced respect to the original position (see keywords above) for an amount that depends on the current value of the atmospheric dispersion corrections and on the small misalignment due to the filter presence.

Pick-Object, A&G sub-panel

The pick-object subpanel, inherited from *RtdImagePick* , is used during acquisition, to compute the centroid of the object. The computed coordinates (X position and Y position) are simply stored in the OLDB and are processed then by the acquisition template, which in turn converts them in the appropriate α and δ offsets required to center the object on the slits.

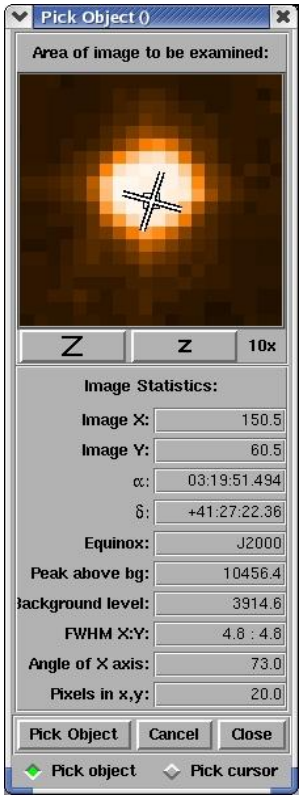

Figure 9 Pick-object sub-panel

Telescope offset, A&G sub-panel

The Telescope offset sub-panel allows to send dedicated commands directly to TCS. Two commands are implemented: OFFSADG, to move the telescope in X and Y direction and OFFSROT, to rotate the Rotator.

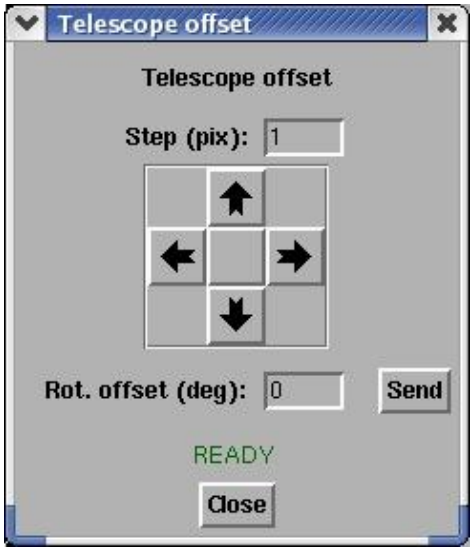

Figure 10 Telescope offset sub-panel

Magnitude evaluation, A&G sub-panel

The Magnitude Evaluation sub-panel is inherited from the *RtdImagePick* class. It computes the magnitude of the selected (picked) object based on the number of counts summed within the ñobject aperture radiusò (radius can be set by the slide bar, bottom left). The actual counts are corrected (subtracted) by the background estimated as a median of the counts within a locus of points set by the ñbackground inner and outer radiusò (slide bars, bottom center and bottom right). To convert background subtracted counts to magnitude, zero points are needed. All the parameters are defined with configuration keywords (see section 6.2.4).

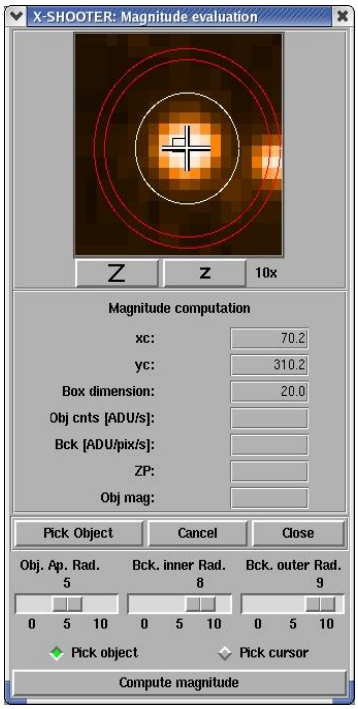

Figure 11 Magnitude evaluation sub-panel

4.5.6 ICS Control panel

This panel (see Figure 12) provides a full control on all the Instrument devices, including simulation mode, states, position, status, etc. It allows the User to enter physical or engineering units. It is based on the ESO standard tool *icbpan* (see **[RD 26]**).
Panel type: Engineering.
Command : % shinsStart –panel ICS

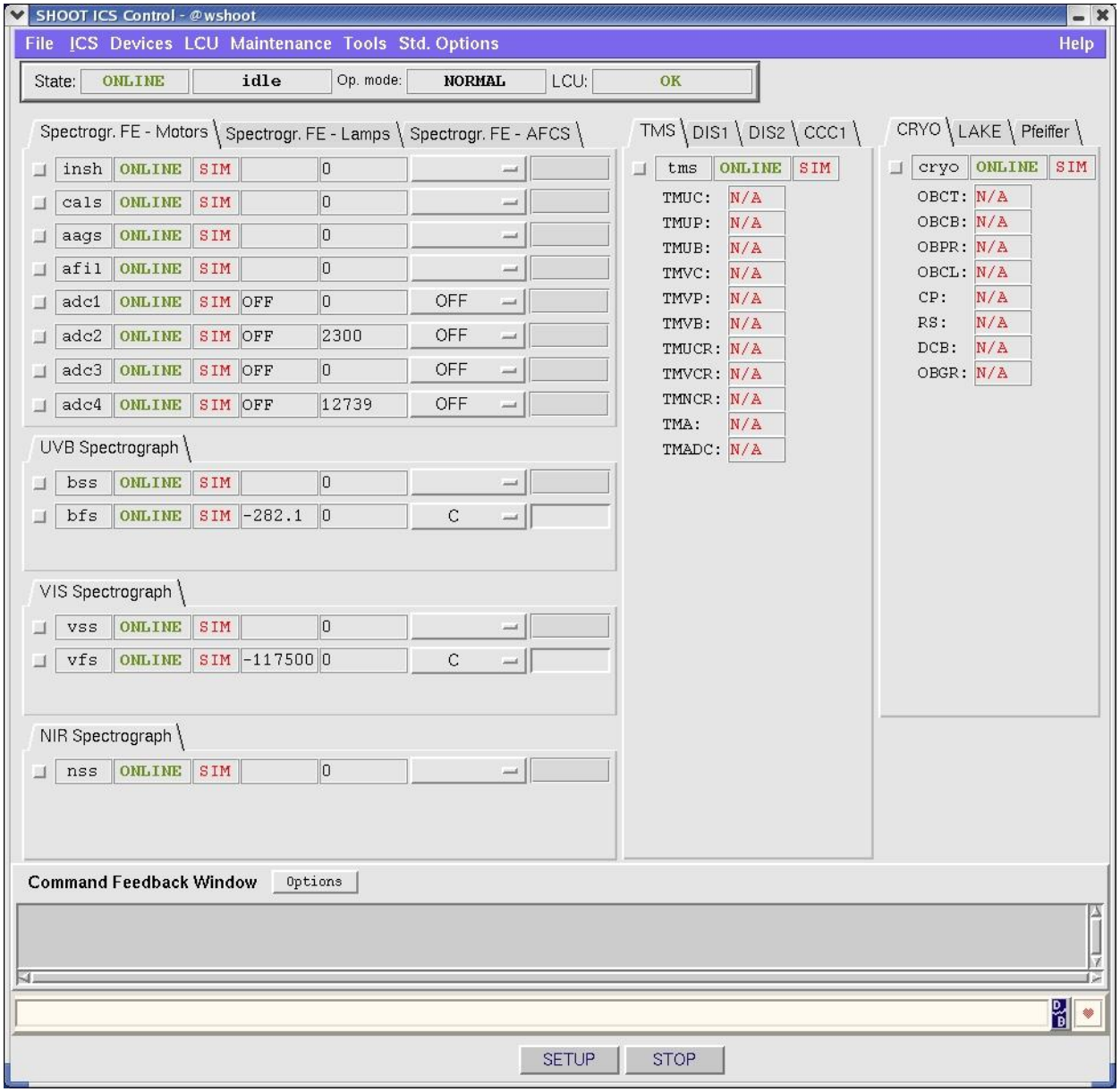

Figure 12 ICS Control panel

4.5.7 OS Engineering panel

It is the basic engineering tool to control the Instrument sub-systems processes (see Figure 13). Each section controls the Startup/Shutdown of the processes of the specific sub-system and controls its state. It is also possible to activate the dedicated stand-alone GUI. From the Menu bar Options it is possible to modify the Simulation Mode of each sub-system.
Panel type: Engineering
Command : % shinsStart –panel OS_ENGINEERING

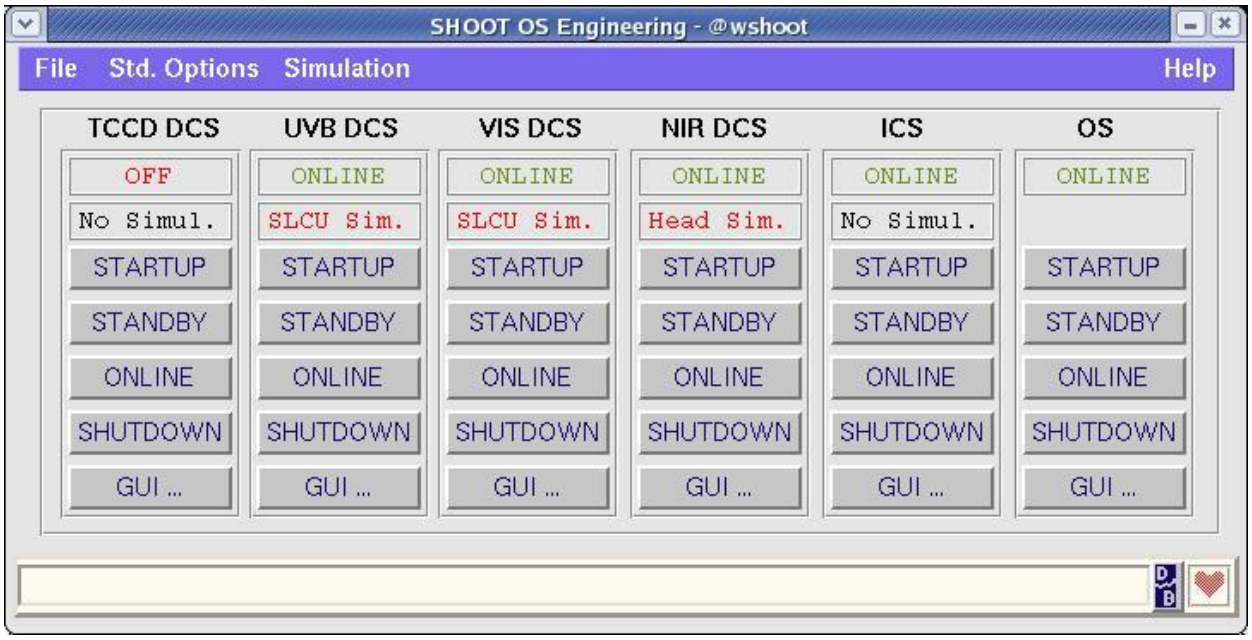

Figure 13 OS Engineering panel

4.6 User Station (TBD)

The GUIs distribution on the User Station screens will be defined at Paranal.

4.7 Alarms

Alarms/warning are displayed on the OS Status panel (see Figure 5) by means of LED widgets. They become green when a sensor value (or a digital bit) is within a valid operational status range. They become red when the value is outside valid limits. The same information is displayed by the ESO standard CCS alarm GUI *alrmDisplay*. See also section 5.4.3.

4.8 Data files location

All data files used and/or generated by the Instrument Software are located under $INS_ROOT as follows:

- Configuration files:
  $INS_ROOT/SYSTEM/COMMON/CONFIGFILES
- Image FITS files, results of exposures:
  $INS_ROOT/SYSTEM/DETDATA
- Setup files:
  $INS_ROOT/SYSTEM/COMMON/SETUPFILES/<type>
  <type> is one of the following: REF, INS, DET, TARG
- Template Signature File:
  $INS_ROOT/SYSTEM/COMMON/TEMPLATES/TSF
- Observation Block Description files:
  $INS_ROOT/SYSTEM/COMMON/TEMPLATES/OBD

They all comply with ESO standards for the Instrumentation software.

5 PROGRAMMER'S GUIDE

This part of the document provides a description of the programmatic interface of the X-shooter Instrument Software.

5.1 Instrument Modes

SHOOT defines the following modes:

- ***SLITSPEC***. Its purpose is to take spectra in Slit Mode with all three arms.
- ***IFUSPEC***. Its purpose is to take spectra in IFU Mode with all three arms.
  SLITSPEC and IFUSPEC modes involve all subsystems: ICS, FIERA, IRACE, TCCD and TCS.
  Independent exposures, one for each arm (UVB, VIS and NIR), can be executed both in a *semi-parallel asynchronous* way (i.e. the exposures on the three detectors are started sequentially, as soon as an arm is idle, to optimize the use of the instrument), and in a *parallel synchronous* way (i.e. the exposures are started at different times in order to make coincide the mid exposure time). See **[AD 10]**.
- ***IMAG.*** Its purpose is to take images with the TCCD of the A&G subsystem. It has no main scientific goals, but it is intended to give to the observer a first look of the field and to give a preliminary guess of the magnitude of unknown objects.
  Subsystems involved are ICS, TCCD and TCS.
- ***CALIB.*** Its purpose is to tag all the calibration images.
  The subsystems involved depend on the particular calibration task.

5.2 Subsystems Identifiers

OS must be able to associate one or more sub-systems to each short-FITS keyword associated to a SETUP command. The filtering criteria are defined in the configuration file $INS_ROOT/SYSTEM/COMMON/CONFIGFILES/shmcfgINS.cfg. The table below provides a summary.

Subsystem	FITS Prefix
OS	OCS
ICS	INS
FIERA SHDETB	DET1
FIERA SHDETV	DET2
IRDCS SHDETR	DET3
TCCD SHTCCD	DET4
TCS	TEL

5.3 Dictionaries

The Instrument Software uses the standard VLT dictionaries to handle setup keywords and to create FITS files with proper header: Moreover, the following dictionaries, specific to X-shooter, have been created

- ESO-VLT-DIC.SHOOT_ICS for the keywords belonging to the ICS sub-system
- ESO-VLT-DIC.SHOOT_DCS for the special keywords belonging to the SHOOT DCS sub-system
- ESO-VLT-DIC.SHOOT_OS for the special keywords belonging to the SHOOT OS sub-system
- ESO-VLT-DIC.SHOOT_CFG for the special keywords belonging to the instrument specific configuration

All instrument specific dictionaries are contained in module *dicSHOOT*. The X-shooter specific keywords are described in Chapter 6.

After installation, the dictionaries can be found in one of the following directories

$INS_ROOT/SYSTEM/Dictionary
$INTROOT/config
$VLTROOT/config

5.4 ICS Software Devices

The ICS Software devices are defined in the configuration file

- $INS_ROOT/SYSTEM/COMMON/CONFIGFILES/shmcfgINS.cfg:

#	Name	Description	Positions	Motor Axis	FITS Prefix	ICB Class	LCU
1	Insh	Instrument shutter	OPEN/CLOSED	circular	INS.OPTI1	icbMOT_OPTI	1
2	cals	Calibration mirror slide	discrete	linear	INS.MIRR1	icbMOT_MIRROR	1
3	spl1	ThAr lamp	ON/OFF	N/A	INS.LAMP1	icbLAMP	2
4	spl2	Ar/Kr/Ne/Xe lamp	ON/OFF	N/A	INS.LAMP2	icbLAMP	2
5	ffl1	UVB low D2 lamp	ON/OFF	N/A	INS.LAMP3	icbLAMP	2
6	ffl2	UVB high lamp	ON/OFF	N/A	INS.LAMP4	icbLAMP	2
7	ffl3	VIS FF lamp	ON/OFF	N/A	INS.LAMP5	icbLAMP	2
8	Ffl4	NIR FF lamp	ON/OFF	N/A	INS.LAMP6	icbLAMP	2
9	Aags	A&G slide	discrete	linear	INS.OPTI2	icbMOT_OPTI	1
10	Afil	A&G filter wheel	discrete	circular	INS.FILT1	icbMOT_FILTER	1
11	adc1	UVB ADC wheel #1	continuous	circular	INS.ADC1	icbMOT_ADC	1
12	adc2	UVB ADC wheel #2	continuous	circular	INS.ADC2	icbMOT_ADC	1
13	adc3	VIS ADC wheel #3	continuous	circular	INS.ADC3	icbMOT_ADC	1
14	adc4	VIS ADC wheel #4	continuous	circular	INS.ADC4	icbMOT_ADC	1
15	Tms	Temperature sensor	N/A	N/A	INS.SENSOR1	icbSEN_ESTERS	2
16	dis1	Digital Sensor	N/A	N/A	INS.SENSOR2	icbSEN_DIGITAL	2
17	dis2	Digital Sensor	N/A	N/A	INS.SENSOR3	icbSEN_DIGITAL	2
18	ccc1	Cooling control sensor 1	N/A	N/A	INS.SENSOR4	icbSEN_COOLING	2
19	Bal	NIR Pressure Sensor	N/A	N/A	INS.SENSOR5	Special device	2
20	afcs1	Flexure comp. UVB	N/A	N/A	INS.TILT1	Special device	2
21	afcs2	Flexure comp. VIS	N/A	N/A	INS.TILT2	Special device	2
22	afcs3	Flexure comp. NIR	N/A	N/A	INS.TILT3	Special device	2
23	Bss	UVB slit	discrete	linear	INS.OPTI3	icbMOT_OPTI	1
24	Bfs	UVB camera focus	continuous	linear	INS.FOCU1	icbMOT_POS	1
25	Vss	VIS slit	discrete	linear	INS.OPTI4	icbMOT_OPTI	1
26	Vfs	VIS camera focus	continuous	linear	INS.FOCU2	icbMOT_POS	1
27	Nss	NIR slit wheel	discrete	circular	INS.OPTI5	icbMOT_OPTI	1
28	Cryo	NIR Cryostat Sensor	N/A	N/A	INS.SENSOR6	icbSEN_LAKESHORE	2
29	Lake	NIR Head Sensor	N/A	N/A	INS.SENSOR7	icbSEN_LAKESHORE	2

Some remarks:

- All motorized devices use ESO standard motion control (Maccon) and amplifier boards.
- Devices *bfs* and *vfs* use a linear formula for user units versus encoder units conversion.
- Device *tms* is connected to the hw device ESTERS DC48 (RS-232)
- Devices *ccc1* is connected to the ESO standard cabinet cooling hw device (RS-232)
- After the integration period at ESO premises in Garching it was verified and agreed that the 2nd standard ESO cabinet cooling unit (*ccc2*) is no longer needed. This device is therefore at present, dropped from the list.
- Device *dis1, dis2* are connected to the ESO standard MEN M58 digital I/O board

5.4.1 ICS Special devices

ICS WS special behaviour

A WS special device class is foreseen to handle non-standard camera focus behavior for the VIS and UVB spectrograph. It takes care to move the focus slide for the right amount, depending on the current temperature before each exposure. The temperature sent to the sw device is computed as the median of the last 20 temperature readings; in case of anomalies (i.e. anomalous temperature reading, broken sensor etc.), a warning/alarm is written in the OLDB and logged. At the FDR (see **[AD 10]**) it was agreed that the refocus mechanism is handled by template. The template checks the *<alias>focusUvbTemp.alarm* (and *<alias>focusVisTemp.alarm* depending on the arm) attribute before sending the keyword INS.FOCUi.UPDATE T: if alarm is set, a pop-up window is raised showing the *last_good* temperature together with the information about when this was acquired, giving the possibility either to send the proposed value or to adjust it. If the *last_good* is not available (for instance not computed yet) a default value is proposed. If the alarm is not set, the median value of the last 20 temperature reading is sent using the keywords: INS.FOCUi.TEMP 0 INS.FOCUi.POS <median value>.
The threshold values are set by means of configuration keywords (see section 6.2.2).
The following special classes handle the refocus mechanism:

- **shiINS_FOCUS:** this class, derived from ic0INS_MOTOR, takes care of focus adjustment, depending on the current temperature before each exposure. The temperature sent to the device is computed as the median of the last 20 temperature readings; in case of anomalies (i.e. anomalous temperature reading, broken sensor etc.), an error will be returned.
- **shiINS_TEMP**: this class computes the median of the last temperature readings stored in a 20-record table *<alias>focusUvbTemp.dataCollection* (*<alias>focusVisTemp.dataCollection)*. If the table is not full (i.e. the instrument was just switched on), only the available data are used for the computation. The computation is performed based on a database event using a callback mechanism implemented in *shiServer.C*. Whenever the sensor value is updated on the WS OLDB the median is computed; if the median is within the valid range, the value is stored in two attributes: *medianTemp* and *last_good*. If the median is not in the valid range the attribute *alarm* is set.

At the FDR it was proposed to use the standard historian tool to collect temperature values. But exhaustive tests during the implementation showed that the historian suffers from severe failures, especially losing events. This was formally described in an SPR (VLTSW20070106). At the time of writing the SPR is still not solved and it was decided therefore to implement a custom table (i.e. *<alias>focusUvb(Vis)Temp.dataCollection)* to handle median computation.

ICS LCU special devices

shibal

None of the pressure sensors standard devices supported by *icb* fulfills the requirements in terms of accuracy and operability in a cryogenic environment. For this reason, a Pfeiffer (formerly Balzers) pressure controller, not supported by *icb*, has been chosen to monitor the NIR arm cryostat pressure values. The software module responsible of the device handling is *shibal*.

The Pfeiffer special device functionality is implemented in two dedicated LCU processes:

- *shibalServer* , which receives commands from the standard *ic0lcuServer* task, executes the corresponding actions and returns the reply.
- *shibalMonitor* , which periodically monitors the status of the hardware associated to the device

The **Hardware interface** is represented by the VME MEN M36 board and the VME ISER 12 board.
The **Software interfaces** are:

- MEN M36 driver for the Balzers device.
- ISER 12 driver for the serial connection.
- Command Interface to the process *ic0lcuServer.*
- OLDB attributes, scanned to the IWS.

The **short FITS prefix** for device BAL is INS.SENS60.VAL.

The following ñbasic courseò describe the operations of the Balzers special device:

Basic Course:

- Device server *shibalServer* receives a STANDBY command
- Device server *shibalServer* reads the OLDB and depending on the simulation level spawns the monitoring task *shibalMonitor*
- The monitoring task reads every 60 sec (this value is hard-coded) the pressure from the MEN device, writes the value in the OLDB and issues an operational log containing the current value

Exception Course: read from MEN failed

- Try once more as recovery procedure
- If failure persists, issue an operational log of type UNFORESEEN and flag the failure by writing an illegal value (9999) in the OLDB
- Keep the same state and keep the monitoring task active

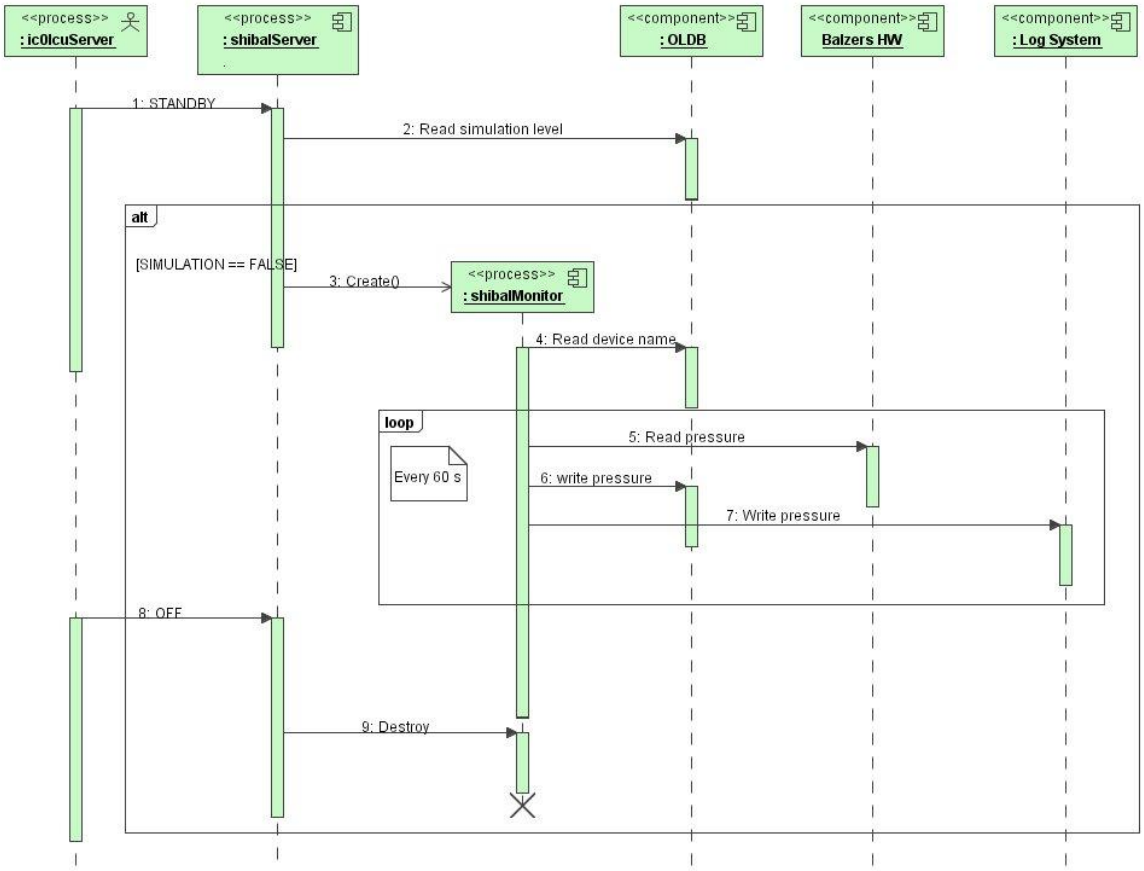

Figure 14 Sequence diagram for the shipzt device showing its basic course.

The communication between the Pfeiffer and the ICS software is done through a serial interface. When the Pfeiffer is put into operation, it starts transmitting measured values in intervals of 1 s. As soon as the first character is transferred to the TPG 261, the automatic transmission of measured values stops. The data transmission is bi-directional, i.e. data and control commands can be transmitted in either direction. The configuration of the serial port is as follows:

- 1 start bit
- 8 data bits
- No parity bit
- 1 stop bit
- No hardware handshake

Messages are transmitted to the Pfeiffer as ASCII strings in the form of mnemonic operating codes and parameters. All mnemonics comprise three ASCII characters. The protocol is shown in the Figure 15.

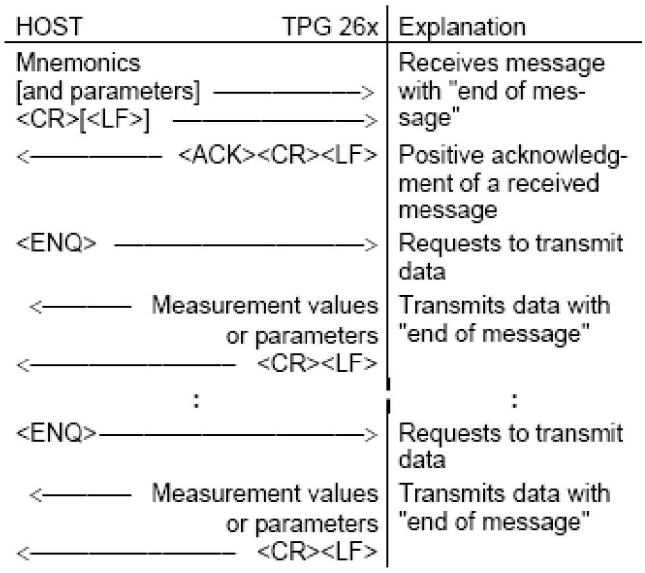

Figure 15 Pfeiffer reception protocol (taken from the Pfeiffer user manual)

<ENQ> means ENQUIRY (Request for data transmission); its decimal value is 10, its HEX value is 05.

The following commands are sent to the device:

- If the device is still not initialized (i.e. in state LOADED) and a STANDBY is issued then the command TID (*Transmitter identification*), followed by the command UNI, 0 (*Unit pressure*; set pressure unit to mbar) is sent. This is used to verify that the communication with the device could be established;
- Once in STANDBY and not in simulation, then every period of time (typically 60 sec), the pressure value is asked by sending the command PR1 (*Pressure measurement (measurement data) gauge 1*). The return value is the pressure value in the current unit.

shipzt

According to the results of the FEA, a correction system is required in order to fulfill the requirements of maximum slit displacement induced by backbone flexures. An active flexure compensation system, based on piezoelectric actuators (one per spectrograph arm) was foreseen. The software module responsible of the flexure handling is *shipzt* and is implemented in two dedicated LCU processes:

- *shipztServer*, which receives commands from the standard *ic0lcuServer* task, executes the corresponding actions and returns the reply.
- *shipztMonitor*, which periodically monitors the position of the telescope/instrument and executes corresponding actions to compensate for the flexures.

The basic operations of the AFC special devices is described in great detail in **[AD 10]**. It uses three hardware I/f represented by the VME MEN M37 (DAC converter), VME MEN M36 (ADC converter) and VME MEN M58 (digital) boards and the basic course is the following:

- Device server *shipztServer* receives a STANDBY command:
  - open the communications with the MEN modules;
  - apply the reference voltage and issues an operational log containing the current value;
  - switch on the piezo amplifier (by rising a digital signal).

  Note: These steps during STANDBY are required to preserve the lifetime of the piezo system.
- Device server *shipztServer* receives an ONLINE command:

- Device server *shipztServer* receives a SETUP command:
  - depending on the passed MODE parameter the following case are handled:
    - PARK ï deactivates the monitoring task and apply a fixed value (read from the OLDB) corresponding to the middle position;
    - STAT ï stops the monitoring task and maintain the current position;
    - REF ï deactivates the monitoring task and moves the tables in a fixed position read in the OLDB, corresponding to the position required for the alignment of the system without flexures (i.e. when the telescope is in zenith position);
    - AUTO ï activates the monitoring task *shipztMonitor*, which periodically calculate and applies the corrections. The task is spawned only once to avoid memory fragmentation and is deleted only when the device is sent to OFF, again to avoid memory fragmentation; when the MODE changes it will be just stopped. The corrections are calculated according to a formula defined by Filippenko (PASP 94, 1715-72, 1982), based on the current telescope/instrument position. The current telescope/instrument position is passed to the LCU using the same mechanism as for the ADC. The required telescope data are scanned from the telescope WS and they are sent to the LCU using the standard mechanism provided by *icb*.
- Other **setup keywords** implemented for these devices are:
  - INS.TILTi.AXISX ï send a given correction to the X axis of the piezo
  - INS.TILTi.AXISY ï send a given correction to the Y axis of the piezo

All the required parameters (i.e. conversion factor, reference voltage for the middle and zenith position etc.) are stored in the *shmcfgINS.cfg* file, where they can be modified (see section 6.2.1 for the definition of the keywords).

It is foreseen that the device will operate in open loop. A feedback is read to get the position in X and Y. Knowing the correction to be applied and having this feedback, it is checked that the applied value actually does the required correction. If not, an error is issued. Once the position is reached, the feedback is not checked anymore.

The description given above is meant to describe the low level behaviour. The overall procedure to estimate the required correction parameters is performed by the high-level software (CLIP I/f and templates) and is described in section 4.4.2.

5.4.2 ICS Assemblies

The ICS assemblies are defined in the configuration file
$INS_ROOT/SYSTEM/COMMON/CONFIGFILES/shmcfgINS.cfg:

#	Name	Description	Commands	Values
1	INS.SENSORS	All sensor devices	STATUS	
2	INS.MODE	Instrument mode	SETUP STATUS	See 5.1
3	INS.PATH	Light path	EXPSTRT EXPEND STATUS	SLITSPEC IFUSPEC IMAG CALIB <blank>
4	INS.LAMP	All lamps	SETUP	OFF
5	INS.ADCB	Controls UVB ADC1 and ADC2	SETUP	OFF AUTO
6	INS.ADCV	Controls VIS ADC3 and ADC4	SETUP	OFF AUTO

5.4.3 Alarms

Alarms/warnings are defined in the OLDB using the standard classes provided by the CCS module *alrm* (see *shiEnv2.db*). Alarms are triggered only if the monitoring is active. CCS OLDB calculation engine functionality is used to achieve this. To define the trigger conditions (i.e. min and max allowed values for normal condition) a custom OLDB class was implemented (shiALARM.class):

```
CLASS BASE_CLASS shiALARM
BEGIN
      ATTRIBUTE   logical   enabled
      ATTRIBUTE   double    minVal
      ATTRIBUTE   double    maxVal
END
```

For each sensor (to be monitored) an instance of this class is created in the OLDB and the corresponding values are filled by means of a set of configuration keywords defined in *shmcfgINS.cfg* and described in section 6.2.3.

Besides, using the standard CCS *alrm* tools, alarms are also displayed on the OS Status GUI (see Figure 4**)** using LED widgets. This LEDs turn RED when the corresponding sensor value is outside the valid range (i.e. value < [.minVal] and value > [.maxVal]). The LED configuration is described in section 6.2.3.

Tentative list of analog sensors, with the min and max threshold values:

ESTERS station	Min threshold	Max Threshold
UVB Camera temp. (C)	0	20
UVB Prism temp. (C)	0	20
UVB Bench temp. (C)	0	20
VIS Camera temp. (C)	0	20
VIS Prism temp. (C)	0	20
VIS bench temp. (C)	0	20
UVB cyo temp. (C)	0	20
VIS cryo temp. (C)	0	20
NIR cryo temp. (C)	0	20
Ambient temp. (C)	0	20
BB UVB ADC temp. (C)	0	20

NIR sensors	Min threshold	Max Threshold
OB Cover tank (K)	103	107
OB Prism (K)	103	107
OB Corrector lens (K)	103	107
Cryo cold plate (K)	103	107
Cryo radiation shield (K)	0	110
OB cover telescope (K)	103	107
CCD Copper bar (K)	0	83
NIR ccd head temp. (K)	0	82
NIR pressure. (mbar)	1e-9	1e-5
UVB fiera chip	134	136
VIS fiera chip	134	136

Some digital signal (coming from the hw ELE) seems inverted to what is expected: *0 means alarm* and *1 means no alarm*. For consistency with other sw alarms, we use the CE to invert this. There is a LED widget (on the OS Status panel) connected to every digital signal (see for instance <alias>DIS1.disAlarm0, <alias>DIS2.dis2Alarm0 etc.), which turns RED when the signal becomes 1 and turns green when the signal becomes 0. The same warning/alarms are reported also on the standard CCS *alrmDisplay* (see *shiEnv2.db*).

5.5 OS specific implementation

X-shooter OS is fully based on BOSS. Only a deviation from standard behavior has been implemented.

X-shooter has three scientific detectors (UVB, VIS and NIR) and a technical CCD used for the A&G sub-system. The A&G TCCD is quite always in continuous loop, showing the telescope field to the user. The exposure status of the TCCD does not affect the global exposure status of the X-shooter OS. To implement this behavior, the class shoINTERFACE_TCCD is inherited from the BOSS class bossINTERFACE_TCCD and disentangles the TCCD exposure status from the global OS exposure status.

6 SETUP and CONFIGURATION KEYWORDS

The files involved in the definition and description of the configuration keywords are:

- Dictionaries
- Configuration files
- Setup files
- FITS filesô headers

All the above files, in the case of X-shooter comply with the ESO standards. Only the X-shooter instrument specific extensions are listed in this section. All the setup and configuration keywords listed below are defined in one of the specific X-shooter dictionaries

- ESO-VLT-DIC.SHOOT_ICS for the keywords belonging to the ICS sub-system
- ESO-VLT-DIC.SHOOT_DCS for the special keywords belonging to the SHOOT DCS sub-system
- ESO-VLT-DIC.SHOOT_OS for the special keywords belonging to the SHOOT OS sub-system
- ESO-VLT-DIC.SHOOT_CFG for the special keywords belonging to the instrument specific configuration

All the ESO-VLT standard keywords are defined in the ESO standard dictionaries stored in $VLTROOT/config.

6.1 Configuration files

The files containing information related to the instrument configuration are:

- ***shmcfgCONFIG.cfg***. It is the master file for the *ctoo* tool and contains basic information about which other files are involved and for what purpose.
- ***shmcfgINS.cfg***. It contains most of the Instrument configuration information (ICS related)
- ***shmcfgINS_DCS.cfg***. It contains the Instrument configuration information related to DCS. The clip camera name is defined here.
- ***shmcfgINS_OS.cfg***. It contains most of the Instrument configuration information. (OS related)
- ***shmcfgSTART.cfg***. It contains only the startup information (e.g. which subsystems are available and at which level of simulation they should work) and is used by *shinsStartup*, *shinsStart* and *shinsStop*, all based on the Startup Tool *stoo* (see `[RD 19]`).
- ***shmcfgTARGET_<target>*.cfg**. It contains the configuration information for a specific target (e.g. for the VLT Control Model).
- ***shmcfgTEST*.cfg**. It contains the configuration information for running self test scripts (see manual page of *inscSelfTest*)
- ***shmcfg*M.dbcfg***. Each of these files contains the configuration of one motor controlled by ICS. They have been created using the VLT Motor Engineering Interface Tool (*motei*, see `[RD 06]`).
- ***shmcfgMAG_CALC*.cfg** It contains zero point corrections for magnitude estimation.
- ***shmcfgAFCREF_<arm>.cfg***. It contains the reference line information for the cross-correlation computation for the flexure compensation
- Other *.cfg and *.dbcfg files are created and used by the standard DCS and Real-Time Display (rtd/irtd) packages.

6.1.1 ICS Assemblies

$INS_ROOT/SYSTEM/COMMON/CONFIGFILES/shmcfgINS.cfg

#	Name	Description	Commands	Values
1	INS.SENSORS	All sensor devices	STATUS	
2	INS.MODE	Instrument mode	SETUP STATUS	See 5.1
3	INS.PATH	Light path	EXPSTRT EXPEND STATUS	SLITSPEC IFUSPEC IMAG

				CALIB <blank>
4	INS.LAMP	All lamps	SETUP	OFF
5	INS.ADCB	Controls UVB ADC1 and ADC2	SETUP	OFF AUTO
6	INS.ADCV	Controls VIS ADC3 and ADC4	SETUP	OFF AUTO

6.1.2 INS keywords

OS and ICS treat these keywords.
$INS_ROOT/SYSTEM/COMMON/CONFIGFILES/shmcfgINS.cfg

Setup keyword	Device	Units	Description	Values
INS.MODE	*(assembly)*	N/A	Instrument mode	SLITSPEC IFUSPEC IMAG CALIB
INS.SHUT1.ST	insh	deg	Instrument shutter - OPEN/CLOSE	T/F
INS.MIRR1.NAME	cals	mm	Calibration Mirror Slide	Tel ThAr_D2 Sphere AFC
INS.LAMP1.ST	spl1	N/A	ThAr ï UVB/VIS spectral lamp	T/F
INS.LAMP2.ST	spl2	N/A	ArKrNeXe ï NIR spectral lamp	T/F
INS.LAMP3.ST	ffl1	N/A	D2 ï UVB Low FF	T/F
INS.LAMP4.ST	ffl2	N/A	UVB High FF	T/F
INS.LAMP5.ST	ffl3	N/A	VIS FF	T/F
INS.LAMP6.ST	ffl4	N/A	NIR FF	T/F
INS.LAMP	(assembly)	N/A	Turn OFF all lamps	OFF
INS.OPTI2.NAME	aags	mm	A&G slide	MIR PIN SLOT PEL IFU
INS.FILT1.NAME	afil	deg	A&G filter	FREE uô gô rô iô zô U B V R I
INS.ADC1.MODE	adc1	deg	UVB ADC #1	OFF AUTO
INS.ADC2.MODE	adc2	deg	UVB ADC #2	OFF AUTO
INS.ADC3.MODE	adc3	deg	VIS ADC #1	OFF AUTO

INS.ADC4.MODE	adc4	deg	VIS ADC #1	OFF AUTO
INS.ADCB.MODE	(assembly)	N/A	UVB ADC mode	OFF AUTO
INS.ADCV.MODE	(assembly)	N/A	VIS ADC mode	OFF AUTO
INS.TILT1.MODE	afcs1	N/A	AFC UVB piezo	AUTO REF PARK STAT
INS.TILT2.MODE	afcs2	N/A	AFC VIS piezo	AUTO REF PARK STAT
INS.TILT3.MODE	afcs3	N/A	AFC NIR piezo	AUTO REF PARK STAT
INS.TILT1.AXISX INS.TILT1.AXISY	afcs1	pix	AFC UVB piezo	Any float number
INS.TILT2.AXISX INS.TILT2.AXISY	afcs2	pix	AFC VIS piezo	Any float number
INS.TILT3.AXISX INS.TILT3.AXISY	afcs3	pix	AFC NIR piezo	Any float number
INS.OPTI3.NAME	bss	mm	UVB slit	0.5x11 0.8x11 1.0x11 1.3x11 1.6x11 5.0x11 1.0x12.6 Pin_0.5 Pin_row
INS.FOCU1.POS	bfs	C (Celsius)	UVB Focus position	Any float number
INS.OPTI4.NAME	vss	mm	VIS slit	0.4x11 0.7x11 0.9x11 1.2x11 1.5x11 5.0x11 1.0x12.6 Pin_0.5 Pin_row
INS.FOCU2.POS	vfs	C (Celsius)	VIS Focus position	Any float number
INS.OPTI5.NAME	nss	Deg	NIR slit	0.4x11 0.6x11 0.9x11 1.2x11 1.5x11 5.0x11 1.0x12.6 Pin_0.4 Pin_0.5 Pin_row Tils_slit Blind

Remarks:

- All motorized devices with encoder can also be addressed to a specific absolute or relative encoder value using the keywords .ENC and .ENCREL (e.g. INS.FILT1.ENC 15000 or INS.FILT1.ENCREL 1000). The usage of these keywords is however limited to engineering/maintenance operations.

6.1.3 DCS keywords

$INS_ROOT/SYSTEM/COMMON/CONFIGFILES/shmcfgDCS.cfg

Keyword	Destination (*)	Description	Values Units
DET.CON.DTT.DISPLAY	s	Enable/disable display of average frame	T / F
DET.CON.DTT.CAMERA	c	Data transfer task camera name (shared memory area)	shdetr_clip

(*) h : FITS header
s : Setup
o : Ops-log

6.2 Sub-system specific keywords

6.2.1 AFC sub-system

$INS_ROOT/SYSTEM/COMMON/CONFIGFILES/shmcfgINS.cfg

All the required parameters (i.e. conversion factor, reference voltage for the middle and zenith position etc.) are defined here.

Keyword Name	Description	Values
These two configuration keywords identify the MEN M36 board (VxWorks device name and port number) used to get the feedback for X position		
INS.FCTILTi.PORTOUTX	feedback X	"/men6";
INS.FCTILTi.CHOUTX	channel for feedback X	0
These two configuration keywords identify the MEN M36 board (VxWorks device name and port number) used to get the feedback for Y position:		
INS.FCTILTi.PORTOUTY	feedback Y	"/men6";
INS.FCTILTi.CHOUTY	channel for feedback Y	1
These two configuration keywords identify the MEN M37 board (VxWorks device name and port number) used to set the voltage for X position:		
INS.FCTILTi.PORTINX	output voltage X	"/men4";
INS.FCTILTi.CHINX	channel for output voltage X	0
These two configuration keywords identify the MEN M37 board (VxWorks device name and port number) used to set the voltage for Y position:		
INS.FCTILTi.PORTINY	output voltage Y	"/men4
INS.FCTILTi.CHINY	channel for output voltage Y	1
These two configuration keywords identify the voltage that is set (X and Y directions),		

when the device is sent to PARK position		
INS.FCTILTi.VREFX	voltage for PARK position (X)	5.0
INS.FCTILTi.VREFY	voltage for PARK position (Y)	5.0
These two configuration keywords identify the voltage that is set (X and Y directions), when the device is sent to REF position (i.e. the position required for the alignment of the system without flexures, when the telescope is in zenith position).		
INS.FCTILTi.REFPOSX	voltage for REF position (X)	0.0
INS.FCTILTi.REFPOSY	voltage for REF position (Y)	0.0
These two configuration keywords identify the MEN M58 board (VxWorks device name and digital bit number) used to switch on the amplifier (i.e. the device)		
INS.FCTILTi.PORTDIG	digital port to switch ampl. on	"/men3";
INS.FCTILTi.CHDIG	bit for switching ampl. On	16
These two configuration keywords identify the conversion factor between Volt and some User Unit. Default is no conversion factor (i.e. 1).		
INS.FCTILTi.UNIT2V		1
INS.FCTILTi.V2UNIT		1
These two configuration keywords identify the reference wavelength and the tracking wavelength.		
INS.FCTILTi.LAMBDAR	reference wavelength	0.405
INS.FCTILTi.LAMBDAT	tracking wavelength	0.550

The following keywords are used by CLIP and by the templates for the cross-correlation of the AFC images and for the conversion from pixel to Voltage (to evaluate the corrections to be sent to the AFC piezos sub-system).

$INS_ROOT/SYSTEM/COMMON/CONFIGFILES/shmcfgAFCRef_xxx.cfg

Keyword Name (*)	Description	Values
OCS.AFCREF.xxx.NO	No. of reference lines in Arm xxx	See file
OCS.AFCREF.xxx.PARXi	Reference line coordinates (pixel) X	See file
OCS.AFCREF.xxx.PARYi	Reference line coordinates (pixel) Y	See file
OCS.AFCREF.xxx.PARi	Polynomial coefficients (1..4) for the conversion (pixel to V)	See file

(*) xxx UVB
VIS
NIR

6.2.2 UVB/VIS Focus settings

$INS_ROOT/SYSTEM/COMMON/CONFIGFILES/shmcfgINS.cfg

INS.UVBRFC.ALRMCWP OLDB point where threshold values are stored;
INS.UVBRFC.ALRMMIN minimum value, below this an alarm is triggered;
INS.UVBRFC.ALRMMAX maximum value, above this an alarm is triggered;
INS.UVBRFC.DEFTEMP default temperature.

INS.VISRFC.ALRMCWP OLDB point where threshold values are stored;

INS.VISRFC.ALRMMIN	minimum value, below this an alarm is triggered;
INS.VISRFC.ALRMMAX	maximum value, above this an alarm is triggered;
INS.VISRFC.DEFTEMP	default temperature.

6.2.3 Alarm configuration

$INS_ROOT/SYSTEM/COMMON/CONFIGFILES/shmcfgINS.cfg
$INS_ROOT/SYSTEM/COMMON/CONFIGFILES/shmcfgINS_OS.cfg

Every sensor to be monitored is configured with the following keywords

INS.SENSORi.ALRMCWPi	OLDB attribute of the shiALARM CLASS;
INS.SENSORi.ALRMMINi	minimum value, below this threshold an alarm is raised;
INS.SENSORi.ALRMMAXi	maximum, value, above this threshold an alarm is raised.

FIERA chip temperature alarm are handled by dedicated keywords set in shmcfgINS_OS.cfg:

OCS.UIF.DETi.ALRMCWP	OLDB attribute of the shiALARM CLASS;
OCS.UIF.DETi.ALRMMIN	minimum value, below this threshold an alarm is raised;
OCS.UIF.DETi.ALRMMAXi	maximum, value, above this threshold an alarm is raised.

Besides, using the standard CCS *alrm* tools, alarms are also displayed on the OS Status GUI (see Figure 4**)** using LED widgets. This LEDs turn RED when the corresponding sensor value is outside the valid range (i.e. value < [.minVal] and value > [.maxVal]). The LED configuration is driven by the following keywords

INS.SENSORi.OCS.UIFLEDMIN8	min threshold value	0
INS.SENSORi.OCS.UIFLEDMAX8	max threshold value	0.99
INS.SENSORi.OCS.UIFLEDCWP8	OLDB attribute to be monitored	"<alias>obgrAlarm.alarm"

6.2.4 GUI configuration

OS Status Panel

$INS_ROOT/SYSTEM/COMMON/CONFIGFILES/shmcfgINS.cfg

A set of configuration keywords is used to place the corresponding sensor in a dedicated *uifFrame* on the OS status panel. In particular:

INSi.SENSORi.STUIFPOSi	determine in which frame (numbered) the sensor should appear;
INSi.SENSORi.UIFLEDMINi	determine, if the sensor should be associated with an *uifLed* and sets the minimum threshold for the led (below, the led becomes red);
INSi.SENSORi.UIFLEDMAXi	determine, if the sensor should be associated with an *uifLed* and sets the maximum threshold for the led (above, the led becomes red);
INSi.SENSORi.UIFLEDCWPi	determine, if the sensor should be associated with an *uifLed* and sets the OLDB address, where data(value) is going to be retrieved.

The overall look&feel of the OS Status Panel is handled by a different set of keywords:

OCS.UIF.MAINLABEL	title of the panel;
OCS.UIF.NFRAMES	set the number of frames used as a placeholders for the sensors *uifOutput* widgets;
OCS.UIF.LABELi	sets the specific label for each frame.

A&G Acquisition Panel

$INS_ROOT/SYSTEM/COMMON/CONFIGFILES/shmcfgINS.cfg

The overlays that can be plotted are the following:

- various slits
  their appearance is handled by a set of dedicated keywords specified in the *shmcfgINS.cfg:*

INS.OPTIi.DRWXCi	central point for each slit in X direction (pixel unit);
INS.OPTIi.DRWYCi	central point for each slit in Y direction (pixel unit);
INS.OPTIi.DRWWIDi	width for each slit (pixel unit);
INS.OPTIi.DRWLENi	length for each slit (pixel unit);
INS.OPTIi.DRWROTi	rotation angle of the slit (respect to X axis) in degree;
INS.OPTIi.DRWCLRi	line color;
INS.OPTIi.DRWLWi	line width;

  Note that each Xshooter slit has this set defined but only few of them (fixed number) are displayed.

- IFU
  its appearance is handled by a set of dedicated keywords specified in the *shmcfgINS.cfg:*

INS.OPTI.DRWXi, INS.OPTI.DRWYi	(X, Y) corner positions;
INS.OPTIi.DRWCLRi	line color;
INS.OPTIi.DRWLWi	line width;

- N/E arrows

- Atmospheric dispersion direction
  the atmospheric dispersion direction is shown by an arrow. Is is computed according to Filippenko (PASP 94, 1715-72, 1982). Perpendicular to the arrow, three additional segments are shown, with red, green and blue color. Their separation represent the amount of the atmospheric dispersion for the central wavelength of the three arms (B=405 nm, V=633 nm, IR=1310 nm) respect to the central wavelength of the chosen A&G filter. The central wavelength of the chosen A&G filter is again specified in the *shmcfgINS.cfg* file with the dedicated keywords

INS.FILTi.CWLENi	central wavelength of the individual A&G Filters

  Note that all the drawings are attached to OLDB and image events. Every time a new image is displayed all the positions for the drawings are recomputed. In particular, depending on the chosen A&G filter, every slit is displaced respect to the original position (see keywords above) for an amount that depends on the current value of the atmospheric dispersion corrections and on the small misalignment due to the filter presence. The central (pinhole) position for each A&G filter is set through the dedicated keywords

INS.FILTi.X0CENi	central pinhole position for the individual A&G Filters (X)
INS.FILTi.Y0CENi	central pinhole position for the individual A&G Filters (Y)

Magnitude evaluation sub-panel

$INS_ROOT/SYSTEM/COMMON/CONFIGFILES/shmcfgMAG_CALC.cfg.

INS.FILTi.ZPi	zero points for magnitude evaluation for the individual A&G Filters

They have been computed by means of standard star observations.

Telescope model

$INS_ROOT/SYSTEM/COMMON/CONFIGFILES/shmcfgINS.cfg

The following keywords describe the configuration of the telescope. Part of them are sent to TCS at the beginning of the Acquisition Template, to set the Telescope Model.
(command SETINSID)

Template Setup kw	Description	Values
OCS.TCCD.SCALE	TCCD scale (arcsec/pix)	0.1764
OCS.TRKWLEN	Telescope Tracking wavelength	470
OCS.ROTOFF	Rotator initial offset	59.14
OCS.FOCUSADA	Telescope focus (nm)	5.66
OCS.VIGNX	Vignetting area X (arcsec)	90.0
OCS.VIGNY	Vignetting area Y (arcsec)	90.0
OCS.POINT.OFFX	Point off-axis X (arcsec)	0.0 (tbd)
OCS.POINT.OFFY	Point off-axis Y (arcsec)	0.0 (tbd)
OCS.PARK.INS	Parking position of the Instrument (rotator position)	-151.0

IFU configuration

$INS_ROOT/SYSTEM/COMMON/CONFIGFILES/shmcfgINS.cfg

The following keywords set the offsets to be applied when using the IFU.

Template Setup kw	Description	Values
OCS.IFU.OFFUVB	IFU offset (Y) to UVB AFC	-0.7
OCS.IFU.OFFVIS	IFU offset (Y) to VIS AFC	0.4
OCS.IFU.OFFNIR	IFU offset (X) to NIR AFC	-0.4

Important note: every time one of this keywords is changed in the configuration file, the dedicated script *shiInsToDb* must be executed to make the changes effective.

6.3 Alias files

No alias file is used.

6.4 Templates keywords

$INS_ROOT/SYSTEM/COMMON/CONFIGFILES/shmcfgINS_OS.cfg

As a rule BOB treats these keywords, they are not forwarded to OS and are used to drive the behavior of the templates itself. The X-shooter specific keywords are listed in the table below. Many of them are also included in the final FITS header of the scientific data.

Template Setup kw	Destination (*)	Description	Values Units
SEQ.SYNC	h s o	Synchronous exposure flag	T / F
SEQ.ARM	h	Instrument arm involved	UVB VIS NIR
SEQ.NEXPO.UVB	s o	No. of exposures for UVB arm	Integer
SEQ.NEXPO.VIS	s o	No. of exposures for VIS arm	Integer
SEQ.NEXPO.NIR	s o	No. of exposures for NIR arm	Integer
SEQ.CAL.MODE	s	Calibration Mode	SLIT IFU

SEQ.AGSNAPSHOT	s	Take a snapshot with A&G before exposures	T / F
SEQ.NOFFSET	s o	No. of Offsets	Integer
SEQ.OFFSET.COORDS	s	Type of offset : X/RA ï Y/DEC	DETECTOR SKY
SEQ.RELOFF1	s	List of X/RA offsets	Float
SEQ.RELOFF2	s	List of Y/DEC offsets	Float
SEQ.RELOFF.RA	h s	List of RA relative offsets	Float
SEQ.RELOFF.DEC	h s	List of DEC relative offsets	Float
SEQ.OBS.TYPE	h s	List of observation type	Object, Sky
SEQ.CUMOFF.RA	h	Cumulative RA offset	Float
SEQ.CUMOFF.DEC	h	Cumulative DEC offset	Float
SEQ.FIXOFF.RA	h s	RA fixed offset	Float
SEQ.FIXOFF.DEC	h s	DEC fixed offset	Float
SEQ.NCYCLES	h s	No. of cycles to observe (OS = 1 cycle)	Integer
SEQ.NOD.THROW	h s	Nodding throw length	Float
SEQ.JITTER.WIDTH	h s	Width of the Jitter Box	Float
SEQ.OFFSET.ZERO	s	Flag: return to zero offset position	T / F
SEQ.AFC.WSIZE	s	Window size for CLIP Cross-correlation	Float
SEQ.AFC.MAXD	s	Max distance for CLIP Cross-correlation	Float
SEQ.AFC.CORRECT	s	AFC correction Flag	T / F
SEQ.AFC.CORRTIME	h	AFC correction time	hh:mm:ss
SEQ.AG.XCEN	h	Slit cords on A&G detector dorrected for atm refr.	Float
SEQ.AG.YCEN	h	Slit cords on A&G detector dorrected for atm refr	Float
SEQ.RRM.REGISTER	c	RRM register keyword	T/F
SEQ.RRM.VISITOR	c	RRM allowed in visitor mode	T/F
CD1_1	h	Coordinate translation matrix-binning factor	Float
CD1_2	h	Coordinate translation matrix	Float
CD2_1	h	Coordinate translation matrix	Float
CD2_2	h	Coordinate translation matrix-binning factor	Float

(*) h : FITS header
s : Setup
o : Ops-log

7 FAQ AND TROUBLESHOOTING

See the Software Twiki Utility at Paranal.

At the end of the Commissioning Phase, the following points are still open:

1. ***ADC2 positioning errors***

   It may happen sometime that ADC2 motor fails in reaching its final position, giving an error. The problem has been reported.
   The problem seems related to the mechanics of the device.
   To recover :
   From the ICS Control Panel select the ADC2 device and re-init it repeatedly.

2. ***The LCU#1 hangs when ADC sub-system goes form AUTO to OFF***

   It may happen that when switching the ADC sub-system from AUTO to OFF mode (e.g. from observation to calibration) the LCU#1 hangs giving the error
   ADCx Task could not be stopped.
   The error has been reported (see SPR VLTSW20080222).
   To recover:
   Reboot LCU#1 and verify that VxWorks kernel version mv2604 is loaded.

3. ***Pfeiffer device initialization error***

   It may happen sometimes that going from OFF to STANDBY the device gives the error
   could not communicate
   To recover
   Re-init the device
   Probably it is a matter of timeout, but there was no possibility to investigate.

8 TEST

The set of test procedures and scripts used is described in detail in **[AD 11]**. They are based on the standard test scheme supported by the Instrumentation Common Software (see **[AD 07]**).
The automatic regression tests are based on the standard Tool for Automated Testing (*tat*, see **[RD 28]**).

9 REFERENCES

This chapter lists details of the Installation and Operational Configuration files.

9.1 Installation Configuration Files

9.1.1 shinsINSTALL.cfg

```
#*******************************************************************************
# E.S.O. - VLT project
#
# "@(#) $Id: shinsINSTALL.cfg,v 0.120 2009/03/20 16:32:15 vltsccm Exp $"
#
# who       when      what
# --------  --------  ----------------------------------------------
# santin   2009-01-21 added hook12 for tccd wcs
#                     moduiles updated end commissioning 2
# epe/psa  2008-11-09 Modules updated for commisioning
# mkiekebu 2008-05-13 added shdnir module
# santin    28/04/06  release 0.22 frozen
# santin    01/02/06  modules rearranged - shortd inserted
# vidali    19/09/05  shidev removed
# vidali    14/07/05  new modules shrtd, shilak and shipzt inserted
# santin    21/03/05  created - with TARGET modules
#
#*******************************************************************************

PAF.HDR.START;                  # Start of PAF Header
PAF.TYPE          "Configuration"; # Type of PAF
PAF.ID            "        ";   # ID for PAF
PAF.NAME          "        ";   # Name of PAF
PAF.DESC          "        ";   # Short description of PAF
PAF.CRTE.NAME     "        ";   # Name of creator
PAF.CRTE.DAYTIM   "        ";   # Civil Time for creation
PAF.LCHG.NAME     "        ";   # Name of person/appl. changing
PAF.LCHG.DAYTIM   "        ";   # Timestamp of last change
PAF.CHCK.NAME     "        ";   # Name of appl. checking
PAF.HDR.END;                    # End of PAF Header

#
# package name, LCU types
#
INSTALL.PACKAGE.NAME      "SHOOT";

INSTALL.PACKAGE.TARGETS    "PARANAL";

# Specify here the LCU CPU type for your instrument.
# For the Template Instrument we do not know it a priori.
# We build therefore the LCU modules for all prossible platforms
INSTALL.MODULE.CPU      "PPC604";

# modules 1..29 reserved for versions of VLTSW modules different from
# those installed in VLTROOT.
INSTALL.APPEND1.FILE "shinsINSTALL_VLTSW.$(VLTSW_RELEASE).cfg";
INSTALL.APPEND2.FILE "shinsINSTALL_COMMON.cfg";
#
# SHOOT modules
#
# General
INSTALL.MODULE30.NAME         "shins";

INSTALL.MODULE31.NAME         "dicSHOOT";
INSTALL.MODULE31.VERSION      "0.69";

# ICS
INSTALL.MODULE32.NAME         "shi";
INSTALL.MODULE32.SUBPKG                "ICS";
INSTALL.MODULE32.VERSION      "0.103";
```

```
INSTALL.MODULE33.NAME          "shipan";
INSTALL.MODULE33.SUBPKG                "ICS";
INSTALL.MODULE33.VERSION       "0.26";

INSTALL.MODULE35.NAME          "shipzt";
INSTALL.MODULE35.SUBPKG                "ICS";
INSTALL.MODULE35.VERSION       "0.59";

INSTALL.MODULE37.NAME          "shibal";
INSTALL.MODULE37.SUBPKG                "ICS";
INSTALL.MODULE37.VERSION       "0.30";

# DCS
INSTALL.MODULE38.NAME          "fcdshdetb";
INSTALL.MODULE38.SUBPKG                "DCS";
INSTALL.MODULE38.VERSION       "0.30";

INSTALL.MODULE39.NAME          "fcdshdetv";
INSTALL.MODULE39.SUBPKG                "DCS";
INSTALL.MODULE39.VERSION       "0.24";

INSTALL.MODULE40.NAME          "shnir";
INSTALL.MODULE40.SUBPKG                "DCS";
INSTALL.MODULE40.VERSION       "1.6";

INSTALL.MODULE41.NAME          "shdnir";
INSTALL.MODULE41.SUBPKG                "DCS";
INSTALL.MODULE41.VERSION       "0.2";

# OS
INSTALL.MODULE42.NAME          "sho";
INSTALL.MODULE42.SUBPKG                "OS";
INSTALL.MODULE42.VERSION       "0.18";

INSTALL.MODULE43.NAME          "shortd";
INSTALL.MODULE43.SUBPKG                "OS";
INSTALL.MODULE43.VERSION       "0.68";

INSTALL.MODULE44.NAME          "shopan";
INSTALL.MODULE44.SUBPKG        "OS";
INSTALL.MODULE44.VERSION       "0.76";

INSTALL.MODULE45.NAME          "shotsf";
INSTALL.MODULE45.SUBPKG                "OS";
INSTALL.MODULE45.VERSION       "1.53";

INSTALL.MODULE46.NAME          "shoseq";
INSTALL.MODULE46.SUBPKG                "OS";
INSTALL.MODULE46.VERSION       "0.101";

# MS
INSTALL.MODULE47.NAME          "shmcfg";
INSTALL.MODULE47.SUBPKG                "MS";
INSTALL.MODULE47.VERSION       "0.198";

INSTALL.MODULE48.NAME          "shmtsf";
INSTALL.MODULE48.SUBPKG                "MS";
INSTALL.MODULE48.VERSION       "1.48";

INSTALL.MODULE49.NAME          "shmseq";
INSTALL.MODULE49.SUBPKG                "MS";
INSTALL.MODULE49.VERSION       "0.71";



#
# users: target installation
#
INSTALL.LOGINNAME.USER       "shoot";
INSTALL.LOGINNAME.USERMGR "shootmgr";

#
# environments
#
```

```
INSTALL.RTAPENV1.NAME   "wshoot";
INSTALL.RTAPENV1.TPLSRC "shins/ENVIRONMENTS/wshoot";

INSTALL.LCUENV1.NAME   "lshics1";
INSTALL.LCUENV1.TPLSRC  "shins/ENVIRONMENTS/lshics1";
INSTALL.LCUENV1.BOOTENV "$INSTALL.RTAPENV1.NAME";

INSTALL.LCUENV2.NAME   "lshics2";
INSTALL.LCUENV2.TPLSRC  "shins/ENVIRONMENTS/lshics2";
INSTALL.LCUENV2.BOOTENV "$INSTALL.RTAPENV1.NAME";

INSTALL.LCUENV3.NAME   "lshtccd";
INSTALL.LCUENV3.TPLSRC  "shins/ENVIRONMENTS/lshtccd";
INSTALL.LCUENV3.BOOTENV "$INSTALL.RTAPENV1.NAME";

#
# Detectors
#
INSTALL.DET1.NAME    "SHDETB"
INSTALL.DET1.TYPE    "FIERA"
INSTALL.DET1.CCDNAME "shdetb"
INSTALL.DET1.CCDLENV "wshubv"
INSTALL.DET1.DBFILE  "fcdSciShdetb.dbcfg"

INSTALL.DET2.NAME    "SHDETV"
INSTALL.DET2.TYPE    "FIERA"
INSTALL.DET2.CCDNAME "shdetv"
INSTALL.DET2.CCDLENV "$INSTALL.DET1.CCDLENV"
INSTALL.DET2.DBFILE  "fcdSciShdetv.dbcfg"

INSTALL.DET3.NAME    "SHDETR"
INSTALL.DET3.TYPE    "IRACE"

INSTALL.DET4.NAME    "SHTCCD"
INSTALL.DET4.TYPE    "ACE"
INSTALL.DET4.CCDNAME "shtccd"
INSTALL.DET4.CCDLENV "$INSTALL.LCUENV3.NAME"
INSTALL.DET4.DBFILE  "ccdTecE2V57I_ENG.dbcfg"
#
# scan links
#
# LCU#1
INSTALL.SCAN1.LOCALENV  "$INSTALL.RTAPENV1.NAME";
INSTALL.SCAN1.REMOTEENV "$INSTALL.LCUENV1.NAME";
INSTALL.SCAN1.FILE      "lshics1.scan";
INSTALL.SCAN1.SRCATTR   "<alias>INSH.state";
INSTALL.SCAN1.DESTATTR  "$INSTALL.SCAN1.SRCATTR";
#
# LCU#2
INSTALL.SCAN2.LOCALENV  "$INSTALL.RTAPENV1.NAME";
INSTALL.SCAN2.REMOTEENV "$INSTALL.LCUENV2.NAME";
INSTALL.SCAN2.FILE      "lshics2.scan";
INSTALL.SCAN2.SRCATTR   "<alias>TMS.last(0)";
INSTALL.SCAN2.DESTATTR  "$INSTALL.SCAN2.SRCATTR";

# Det UVB
INSTALL.SCAN3.LOCALENV  "$INSTALL.RTAPENV1.NAME";
INSTALL.SCAN3.REMOTEENV "$INSTALL.DET1.CCDLENV";
INSTALL.SCAN3.SCRIPT    "DCS";
INSTALL.SCAN3.SRCATTR   "<alias>$INSTALL.DET1.CCDNAME:exposures:exposure_1.timeDef";
INSTALL.SCAN3.DESTATTR  "$INSTALL.SCAN3.SRCATTR";
# Det VIS
INSTALL.SCAN4.LOCALENV  "$INSTALL.RTAPENV1.NAME";
INSTALL.SCAN4.REMOTEENV "$INSTALL.DET2.CCDLENV";
INSTALL.SCAN4.SCRIPT    "DCS";
INSTALL.SCAN4.SRCATTR   "<alias>$INSTALL.DET2.CCDNAME:exposures:exposure_1.timeDef";
INSTALL.SCAN4.DESTATTR  "$INSTALL.SCAN4.SRCATTR";
# Det TCCD
INSTALL.SCAN5.LOCALENV  "$INSTALL.RTAPENV1.NAME";
INSTALL.SCAN5.REMOTEENV "$INSTALL.LCUENV3.NAME";
INSTALL.SCAN5.SCRIPT    "DCS";
INSTALL.SCAN5.SRCATTR   "<alias>shtccd:telemetry.status";
INSTALL.SCAN5.DESTATTR  "$INSTALL.SCAN5.SRCATTR";

# TCS --> wt3tcs
```

```
# commented out for the first tests
INSTALL.SCAN6.LOCALENV  "$INSTALL.RTAPENV1.NAME";
INSTALL.SCAN6.REMOTEENV "wt3tcs";
INSTALL.SCAN6.SCRIPT    "tifTcsScanSetup -dev -p :Appl_data:TCS -t $INSTALL.SCAN6.REMOTEENV";
INSTALL.SCAN6.SRCATTR   "Appl_data:TCS.version";
INSTALL.SCAN6.DESTATTR  "Appl_data:TCS:info.version";

#
# hook to do all actions needed at the end of installation
#
# --------------------------------------------------------
INSTALL.HOOK1.NAME    "AFTER_INSTALL";
INSTALL.HOOK1.PLUGIN  "icbInstallHook $INSTALL.PACKAGE.NAME";
# --------------------------------------------------------

# --------------------------------------------------------
INSTALL.HOOK2.NAME    "AFTER_START_WSENV";
INSTALL.HOOK2.PLUGIN  "shiInsToDb";
# --------------------------------------------------------

# -------------------------------------------
# -- FIERA is not supposed ------------------
# -- to be rebuilt every time ---------------
# --> commented out ----------------------------
# -------------------------------------------
#INSTALL.HOOK3.NAME    "BEFORE_CLEAN";
#INSTALL.HOOK3.PLUGIN  "inscDetSLcu -env $INSTALL.DET1.CCDLENV -ccd $INSTALL.DET1.CCDNAME -ccd2
$INSTALL.DET2.CCDNAME -clean";
# --------------------------------------------------------

# -------------------------------------------
# -- IRACE is not supposed ------------------
# -- to be cleaned every time ---------------
# --> commented out ----------------------------
# -------------------------------------------
#INSTALL.HOOK4.NAME    "BEFORE_CLEAN";
#INSTALL.HOOK4.PLUGIN  "inscDetSLcu -host wshnir -clean";
# --------------------------------------------------------

# modules
# - irace
# - shnir
# must be synchronized with wshoot on IRACE WS
# --> re-install
# --------------------------------------------------------
## irace module
#INSTALL.HOOK5.NAME    "AFTER_BUILD_MOD";
#INSTALL.HOOK5.PLUGIN  "inscDetSLcu -host wshnir -module $INSTALL.MODULE4.NAME -version
$INSTALL.MODULE4.VERSION";
## shnir module
#INSTALL.HOOK6.NAME    "AFTER_BUILD_MOD";
#INSTALL.HOOK6.PLUGIN  "inscDetSLcu -host wshnir -module $INSTALL.MODULE40.NAME -version
$INSTALL.MODULE40.VERSION";
# --------------------------------------------------------
#
# Since modules ccdrdb and arcdrv are installed on top of the VLTROOT,
# file ccd has to be re-created after the build.
#
INSTALL.HOOK7.NAME    "AFTER_BUILD_MOD";
INSTALL.HOOK7.PLUGIN  "ccdLink";
# --------------------------------------------------------

# -- Stop remote FIERA environment -----------------------
INSTALL.HOOK8.NAME    "AFTER_STOP_ENV";
INSTALL.HOOK8.PLUGIN  "inscDetSLcu -env $INSTALL.DET1.CCDLENV -ccd $INSTALL.DET1.CCDNAME -ccd2
$INSTALL.DET2.CCDNAME -stop";
# --------------------------------------------------------

# -- install FIERA configuration -----------------------
INSTALL.HOOK9.NAME    "AFTER_BUILD_ENV";
INSTALL.HOOK9.PLUGIN  "inscDetSLcu -env $INSTALL.DET1.CCDLENV -ccd $INSTALL.DET1.CCDNAME -ccd2
$INSTALL.DET2.CCDNAME -build";
# --------------------------------------------------------

# -- HOOK10 reserved for RRM (TARGET=PARANAL) --
```

```
# -- Start remote FIERA environment -----------------------
INSTALL.HOOK11.NAME    "AFTER_START_LCUENV";
INSTALL.HOOK11.PLUGIN  "inscDetSLcu -env $INSTALL.DET1.CCDLENV -ccd $INSTALL.DET1.CCDNAME -ccd2
$INSTALL.DET2.CCDNAME -start";
# ------------------------------------------------------

# -- HOOK12 reserved for WCS (TARGET=PARANAL)

# ------------------------------------------------------
# HOOKs 15 - 16 left available to start TCSSIM in simulation environments
# AFTER_CREATE_SCAN
# ------------------------------------------------------
#
# install the .bobrc link in the user account
#
INSTALL.FILES1.NAME    "BOBRC";
INSTALL.FILES1.DESTUSER "$INSTALL.LOGINNAME.USER";
INSTALL.FILES1.LINK1   "shins.bobrc .bobrc";

# ___oOo___
```

9.1.2 shinsTARGET_PARANAL.cfg

```
#*******************************************************************************
# E.S.O. - VLT project
#
# "@(#) $Id: shinsTARGET_PARANAL.cfg,v 0.120 2009/03/20 16:32:15 vltsccm Exp $"
#
# who       when      what
# --------  --------  ----------------------------------------------
# santin    18/12/08  created
#
#*******************************************************************************

PAF.HDR.START;                 # Start of PAF Header
PAF.TYPE          "Configuration"; # Type of PAF
PAF.ID            "         ";   # ID for PAF
PAF.NAME          "         ";   # Name of PAF
PAF.DESC          "         ";   # Short description of PAF
PAF.CRTE.NAME     "         ";   # Name of creator
PAF.CRTE.DAYTIM   "         ";   # Civil Time for creation
PAF.LCHG.NAME     "         ";   # Name of person/appl. changing
PAF.LCHG.DAYTIM   "         ";   # Timestamp of last change
PAF.CHCK.NAME     "         ";   # Name of appl. checking
PAF.HDR.END;                   # End of PAF Header

#

# -- Configure (and enable) RRM - only at Paranal
INSTALL.HOOK10.NAME    "AFTER_START_WSENV";
INSTALL.HOOK10.PLUGIN  "rrmInstall";
#
# -- Fill TCCD OLDB with info for WCS eveluation (only at Paranal)
INSTALL.HOOK12.NAME     "AFTER_INSTALL_CCD"
INSTALL.HOOK12.PLUGIN   "shinsTccdWcs";

# ------------------------------------------------------


# ___oOo___
```

9.2 Configuration Files

9.2.1 shmcfgINS_cfg

```
#*******************************************************************************
# E.S.O. - VLT project
#
# "@(#) $Id: shmcfgINS.cfg,v 0.199 2009/03/23 15:15:11 vltsccm Exp $"
#
# who       when      what
# --------  --------  ----------------------------------------------
# vidali    03/05/06  Lamp signal bits arranged according to the configuration
#                     of the test board at OAT
# vidali    03/01/06  Devices list updated for FDR according to electronics
#                     documents
# vidali    25/11/05  INS.ADC3 and INS.ADC4 added
# vidali    07/04/05  *.OCS.UIF* keywords added
# santin    31/03/05  created following templates
# santin    31/03/05  removed OS configuration section
#                     moved to INS_OS.cfg
# santin    25/01/06  added PATH for IMAG and CALIB modes
#
#*******************************************************************************
#================================================================================================================
========================================
# Description           | Positions  | Motor Axis    | Units| short-FITS | setup parameters  | SHOOT |
icb class      | Remarks
#================================================================================================================
========================================

#================================================================================================================
========================================
PAF.HDR.START;                  # Start of PAF Header
PAF.TYPE          "Configuration"; # Type of PAF
PAF.ID            "         ";   # ID for PAF
PAF.NAME          "         ";   # Name of PAF
PAF.DESC          "         ";   # Short description of PAF
PAF.CRTE.NAME     "         ";   # Name of creator
PAF.CRTE.DAYTIM   "         ";   # Civil Time for creation
PAF.LCHG.NAME     "         ";   # Name of person/appl. changing
PAF.LCHG.DAYTIM   "         ";   # Timestamp of last change
PAF.CHCK.NAME     "         ";   # Name of appl. checking
PAF.HDR.END;                    # End of PAF Header

#
# 1.0 Startup config.
#
START.CON.TYPE          "INS"; # Application type
START.CON.TCLFILE "shinsStoo"; # Startup user extensions

#
# 1.1 General instrument config.
#
INS.CON.ID                      "SHOOT"; # Instrument identifier
INS.ID       "SHOOT/$Revision: 0.199 $"; # Instrument identifier
INS.CON.PREFIX                    "sh"; # Name prefix for modules and servers
#OCS.CON.OSDBROOT        "<alias>sho"; # db address of the OS process
#INS.CON.DBROOT     ":Appl_data:SHOOT"; # Instrument OLDB root point

#
# 1.2 Environments and LCUs
#
INS.CON.WSENV           "wshoot"; # Workstation RTAP environment
INS.CON.LCUNUM                2; # Number of instrument LCUs
INS.CON.LCUENV1         "lshics1"; # LCU 1 environment
INS.CON.LCUENV2         "lshics2"; # LCU 1 environment


#
```

```
# 2.1 ICS general config.
#
# INS.CON.OPMODE removed (set in shmcfgSTART.cfg)
INS.CON.ONLINE                F; # If T, sensors are placed online during booting.
INS.CON.CONFIGSET "shiConfigSet"; # User script called by icbConfigSet
INS.CON.CMDTOUT           45000; # Timeout for other cmds. [msec]
INS.CON.MOVETOUT          160000; # Timeout for movement cmds. [msec]
#INS.CON.MOVETDIF             1; # Interval between parallel movements [msec]
#INS.CON.MONTIME           60000; # Device monitoring period [msec]
#INS.CON.MOVEMAX             100; # Max. number of devices moving in parallel

INS.CON.DEVNUM               29; # Number of ICS devices
INS.CON.DEVICE1     "INS.OPTI1"; # Device FITS prefix used in the config file
INS.CON.DEVICE2     "INS.MIRR1"; # Device FITS prefix used in the config file
INS.CON.DEVICE3     "INS.LAMP1"; # Device FITS prefix used in the config file
INS.CON.DEVICE4     "INS.LAMP2"; # Device FITS prefix used in the config file
INS.CON.DEVICE5     "INS.LAMP3"; # Device FITS prefix used in the config file
INS.CON.DEVICE6     "INS.LAMP4"; # Device FITS prefix used in the config file
INS.CON.DEVICE7     "INS.LAMP5"; # Device FITS prefix used in the config file
INS.CON.DEVICE8     "INS.LAMP6"; # Device FITS prefix used in the config file
INS.CON.DEVICE9     "INS.OPTI2"; # Device FITS prefix used in the config file
INS.CON.DEVICE10    "INS.FILT1"; # Device FITS prefix used in the config file
INS.CON.DEVICE11     "INS.ADC1"; # Device FITS prefix used in the config file
INS.CON.DEVICE12     "INS.ADC2"; # Device FITS prefix used in the config file
INS.CON.DEVICE13     "INS.ADC3"; # Device FITS prefix used in the config file
INS.CON.DEVICE14     "INS.ADC4"; # Device FITS prefix used in the config file
INS.CON.DEVICE15  "INS.SENSOR1"; # Device FITS prefix used in the config file
INS.CON.DEVICE16  "INS.SENSOR2"; # Device FITS prefix used in the config file
INS.CON.DEVICE17  "INS.SENSOR3"; # Device FITS prefix used in the config file
INS.CON.DEVICE18  "INS.SENSOR4"; # Device FITS prefix used in the config file
INS.CON.DEVICE19  "INS.SENSOR5"; # Device FITS prefix used in the config file
INS.CON.DEVICE20  "INS.SENSOR6"; # Device FITS prefix used in the config file
INS.CON.DEVICE21  "INS.FCTILT1"; # Device FITS prefix used in the config file
INS.CON.DEVICE22  "INS.FCTILT2"; # Device FITS prefix used in the config file
INS.CON.DEVICE23  "INS.FCTILT3"; # Device FITS prefix used in the config file
INS.CON.DEVICE24    "INS.OPTI3"; # Device FITS prefix used in the config file
INS.CON.DEVICE25     "INS.POS1"; # Device FITS prefix used in the config file
INS.CON.DEVICE26    "INS.OPTI4"; # Device FITS prefix used in the config file
INS.CON.DEVICE27     "INS.POS2"; # Device FITS prefix used in the config file
INS.CON.DEVICE28    "INS.OPTI5"; # Device FITS prefix used in the config file
INS.CON.DEVICE29  "INS.SENSOR7"; # Device FITS prefix used in the config file

# ccc2 removed during ESO integration
# INS.CON.DEVICE30  "INS.SENSOR8"

#
#  Instrument shutter
#

INS.OPTI1.DEVNAME       "insh"; # Name of the ICS device
INS.OPTI1.DEVDESC "Instrument shutter"; # Description of the ICS device
INS.OPTI1.LCUID             1; # Id. of the LCU managing the device
INS.OPTI1.SWSIM             F; # If T, function is software simulated
INS.OPTI1.PREFIX  "INS.SHUT1";

INS.OPTI1.POSNUM          2;
INS.OPTI1.POSID1       "OPEN";
INS.OPTI1.POSID2     "CLOSED";

INS.OPTI1.ID1           "OPEN";
INS.OPTI1.NAME1         "OPEN";
INS.OPTI1.TYPE1      "SHUTTER"; # Element type
INS.OPTI1.ID2         "CLOSED";
INS.OPTI1.NAME2       "CLOSED";
INS.OPTI1.TYPE2      "SHUTTER"; # Element type

# used by OS status panel (shopanStatus)
INS.OPTI1.STUIFPOS         1;

#
# CALS mirror wheel
#
INS.MIRR1.DEVNAME      "cals"; # Name of the ICS device
INS.MIRR1.DEVDESC "Calib. mirror slide"; # Description of the ICS device
INS.MIRR1.LCUID             1; # Id. of the LCU managing the device
```

```
#INS.MIRR1.INIALONE        F; # If T, initialise alone
INS.MIRR1.SWSIM             F; # If T, function is software simulated


INS.MIRR1.POSNUM            4;
INS.MIRR1.POSID1        "Tel";
INS.MIRR1.POSID2    "ThAr_D2";
INS.MIRR1.POSID3     "Sphere";
INS.MIRR1.POSID4        "AFC";

INS.MIRR1.ID1           "Tel";
INS.MIRR1.NAME1         "Tel";
INS.MIRR1.TYPE1      "MIRROR";
INS.MIRR1.ID2       "ThAr_D2";
INS.MIRR1.NAME2     "ThAr_D2";
INS.MIRR1.TYPE2      "MIRROR";
INS.MIRR1.ID3        "Sphere";
INS.MIRR1.NAME3      "Sphere";
INS.MIRR1.TYPE3      "MIRROR";
INS.MIRR1.ID4           "AFC";
INS.MIRR1.NAME4         "AFC";
INS.MIRR1.TYPE4      "MIRROR";

# used by OS status panel (shopanStatus)
INS.MIRR1.STUIFPOS         2;


#
# Spectral calib lamp 1 (Th Ar)
#
INS.LAMP1.DEVNAME      "spl1"; # Name of the ICS device
INS.LAMP1.DEVDESC "ThAr lamp"; # Description of the ICS device
INS.LAMP1.LCUID             2; # Id. of the LCU managing the device
INS.LAMP1.SWSIM             F; # If T, function is software simulated

INS.LAMP1.ID           "SPL1";
INS.LAMP1.NAME    "ThAr_Lamp";
INS.LAMP1.MAXON          3600;
INS.LAMP1.SIGDEV      "/men0";
INS.LAMP1.SIGBIT1          16; # Switch On/Off command
INS.LAMP1.SIGBIT3           2; # Mode
INS.LAMP1.SIGBIT4           0; # Lamp On/Off state
INS.LAMP1.SIGBIT6           1; # Fault condition
INS.LAMP1.IGFAULT           F;

# used by OS status panel (shopanStatus)
INS.LAMP1.STUIFPOS         2;


#
# Spectral calib lamp 2 (Ar Kr Ne Xe)
#
INS.LAMP2.DEVNAME      "spl2"; # Name of the ICS device
INS.LAMP2.DEVDESC "Ar/Kr/Ne/Xe lamp"; # Description of the ICS device
INS.LAMP2.LCUID             2; # Id. of the LCU managing the device
INS.LAMP2.SWSIM             F; # If T, function is software simulated

INS.LAMP2.ID           "SPL2";
INS.LAMP2.NAME    "ArKrNeXe_Lamp";
INS.LAMP2.MAXON          3600;

INS.LAMP2.SIGDEV      "/men0";
INS.LAMP2.SIGBIT1          17; # Switch On/Off command
INS.LAMP2.SIGBIT3           5; # Mode
INS.LAMP2.SIGBIT4           3; # Lamp On/Off state
INS.LAMP2.SIGBIT6           4; # Fault condition
INS.LAMP2.IGFAULT           F;

# used by OS status panel (shopanStatus)
INS.LAMP2.STUIFPOS         2;


#
# FF lamp 1
#
```

```
INS.LAMP3.DEVNAME      "ffl1"; # Name of the ICS device
INS.LAMP3.DEVDESC "UVB low D2 lamp"; # Description of the ICS device
INS.LAMP3.LCUID             2; # Id. of the LCU managing the device
INS.LAMP3.SWSIM             F; # If T, function is software simulated

INS.LAMP3.ID           "FFL1";
INS.LAMP3.NAME    "UVB_Low_D2";
INS.LAMP3.MAXON          3600;

INS.LAMP3.SIGDEV     "/men0";
INS.LAMP3.SIGBIT1          18; # Switch On/Off command
INS.LAMP3.SIGBIT3           8; # Mode
INS.LAMP3.SIGBIT4           6; # Lamp On/Off state
INS.LAMP3.SIGBIT6           7; # Fault condition
INS.LAMP3.IGFAULT           F;
INS.LAMP3.WARMUP           20; # Warm-up time of the lamp (sec)
INS.LAMP3.WAIT             30; # Max time to wait (sec)

# used by OS status panel (shopanStatus)
INS.LAMP3.STUIFPOS         2;


#
# FF lamp 2
#
INS.LAMP4.DEVNAME      "ffl2"; # Name of the ICS device
INS.LAMP4.DEVDESC "UVB high lamp"; # Description of the ICS device
INS.LAMP4.LCUID             2; # Id. of the LCU managing the device
INS.LAMP4.SWSIM             F; # If T, function is software simulated

INS.LAMP4.ID          "FFL2";
INS.LAMP4.NAME    "UVB_High";
INS.LAMP4.MAXON          3600;

INS.LAMP4.SIGDEV      "/men0";
INS.LAMP4.SIGBIT1          19; # Switch On/Off command
INS.LAMP4.SIGBIT3          11; # Mode
INS.LAMP4.SIGBIT4           9; # Lamp On/Off state
INS.LAMP4.SIGBIT6          10; # Fault condition
INS.LAMP4.IGFAULT           F;

# used by OS status panel (shopanStatus)
INS.LAMP4.STUIFPOS         2;


#
# FF lamp 3
#
INS.LAMP5.DEVNAME      "ffl3"; # Name of the ICS device
INS.LAMP5.DEVDESC "VIS FF lamp"; # Description of the ICS device
INS.LAMP5.LCUID             2; # Id. of the LCU managing the device
INS.LAMP5.SWSIM             F; # If T, function is software simulated

INS.LAMP5.ID          "FFL3";
INS.LAMP5.NAME    "VIS_FF_lamp";
INS.LAMP5.MAXON          3600;

INS.LAMP5.SIGDEV      "/men0";
INS.LAMP5.SIGBIT1          20; # Switch On/Off command
INS.LAMP5.SIGBIT3          14; # Mode
INS.LAMP5.SIGBIT4          12; # Lamp On/Off state
INS.LAMP5.SIGBIT6          13; # Fault condition
INS.LAMP5.IGFAULT           F;

# used by OS status panel (shopanStatus)
INS.LAMP5.STUIFPOS         2;


#
# FF lamp 4
#
INS.LAMP6.DEVNAME      "ffl4"; # Name of the ICS device
INS.LAMP6.DEVDESC "NIR FF lamp"; # Description of the ICS device
INS.LAMP6.LCUID             2; # Id. of the LCU managing the device
INS.LAMP6.SWSIM             F; # If T, function is software simulated
```

```
INS.LAMP6.ID           "FFL4";
INS.LAMP6.NAME    "NIR_FF_lamp";
INS.LAMP6.MAXON          3600;

INS.LAMP6.SIGDEV      "/men1";
INS.LAMP6.SIGBIT1          16; # Switch On/Off command
INS.LAMP6.SIGBIT3          2; # Mode
INS.LAMP6.SIGBIT4          0; # Lamp On/Off state
INS.LAMP6.SIGBIT6          1; # Fault condition
INS.LAMP6.IGFAULT           F;

# used by OS status panel (shopanStatus)
INS.LAMP6.STUIFPOS         2;


#
# A&G slide
#
INS.OPTI2.DEVNAME      "aags"; # Name of the ICS device
INS.OPTI2.DEVDESC "A&G slide"; # Description of the ICS device
INS.OPTI2.LCUID             1; # Id. of the LCU managing the device
#INS.OPTI2.INIALONE        F; # If T, initialise alone
INS.OPTI2.SWSIM             F; # If T, function is software simulated

INS.OPTI2.POSNUM           5;
INS.OPTI2.POSID1         "MIR";
INS.OPTI2.POSID2         "PIN";
INS.OPTI2.POSID3         "SLOT";
INS.OPTI2.POSID4         "PEL";
INS.OPTI2.POSID5         "IFU";


INS.OPTI2.ID1            "MIR";
INS.OPTI2.NAME1          "MIR";
INS.OPTI2.TYPE1      "MIRROR"; # Element type
INS.OPTI2.ID2            "PIN";
INS.OPTI2.NAME2          "PIN";
INS.OPTI2.TYPE2      "MIRROR"; # Element type
INS.OPTI2.ID3            "SLOT";
INS.OPTI2.NAME3          "SLOT";
INS.OPTI2.TYPE3      "MIRROR"; # Element type
INS.OPTI2.ID4            "PEL";
INS.OPTI2.NAME4          "PEL";
INS.OPTI2.TYPE4      "MIRROR"; # Element type
INS.OPTI2.ID5            "IFU";
INS.OPTI2.NAME5          "IFU";
INS.OPTI2.TYPE5      "MIRROR"; # Element type

# used by OS status panel (shopanStatus)
INS.OPTI2.STUIFPOS         3;

# used by shortd to display IFU
INS.OPTI2.DRWCWP         "<alias>shortdIfu";
INS.OPTI2.DRWX0          246.2;
INS.OPTI2.DRWY0          282.1;
INS.OPTI2.DRWX1          269.0;
INS.OPTI2.DRWY1          282.1;
INS.OPTI2.DRWX2          246.2;
INS.OPTI2.DRWY2          292.3;
INS.OPTI2.DRWCLR         "green";
INS.OPTI2.DRWLW          1;



#
# A&G filter wheel
#
INS.FILT1.DEVNAME      "afil"; # Name of the ICS device
INS.FILT1.DEVDESC "A&G filter wheel"; # Description of the ICS device
INS.FILT1.LCUID             1; # Id. of the LCU managing the device
#INS.FILT1.INIALONE        F; # If T, initialise alone
INS.FILT1.SWSIM             F; # If T, function is software simulated

INS.FILT1.POSNUM          12;
```

```
INS.FILT1.POSID1        "PS1";
INS.FILT1.POSID2        "PS2";
INS.FILT1.POSID3        "PS3";
INS.FILT1.POSID4        "PS4";
INS.FILT1.POSID5        "PS5";
INS.FILT1.POSID6        "PS6";
INS.FILT1.POSID7        "PS7";
INS.FILT1.POSID8        "PS8";
INS.FILT1.POSID9        "PS9";
INS.FILT1.POSID10       "PS10";
INS.FILT1.POSID11       "PS11";
INS.FILT1.POSID12       "PS12";

INS.FILT1.ID1           "PS1";
INS.FILT1.NAME1          "u'";
INS.FILT1.ID2           "PS2";
INS.FILT1.NAME2          "g'";
INS.FILT1.ID3           "PS3";
INS.FILT1.NAME3          "r'";
INS.FILT1.ID4           "PS4";
INS.FILT1.NAME4       "PV(B)";
INS.FILT1.ID5           "PS5";
INS.FILT1.NAME5           "U";
INS.FILT1.ID6           "PS6";
INS.FILT1.NAME6           "R";
INS.FILT1.ID7           "PS7";
INS.FILT1.NAME7       "PV(V)";
INS.FILT1.ID8           "PS8";
INS.FILT1.NAME8           "B";
INS.FILT1.ID9           "PS9";
INS.FILT1.NAME9           "V";
INS.FILT1.ID10         "PS10";
INS.FILT1.NAME10          "i'";
INS.FILT1.ID11         "PS11";
INS.FILT1.NAME11          "I";
INS.FILT1.ID12         "PS12";
INS.FILT1.NAME12          "z'";

# used by OS status panel (shopanStatus)
INS.FILT1.STUIFPOS         3;

# central wavelength used in shortd computation
INS.FILT1.CWLEN1          354;               # u'
INS.FILT1.CWLEN2          477;               # g'
INS.FILT1.CWLEN3          623;               # r'
INS.FILT1.CWLEN4          800;               # PV(B)
INS.FILT1.CWLEN5          365;               # U
INS.FILT1.CWLEN6          640;               # R
INS.FILT1.CWLEN7          800;               # PV(V)
INS.FILT1.CWLEN8          436;               # B
INS.FILT1.CWLEN9          545;               # V
INS.FILT1.CWLEN10         762;               # i'
INS.FILT1.CWLEN11         798;               # I
INS.FILT1.CWLEN12         913;               # z'

# pinhole positions on A&G tccd according to filter
INS.FILT1.X0CEN1          257.4;      # u'
INS.FILT1.Y0CEN1          286.9;
INS.FILT1.X0CEN2          257.6;      # g'
INS.FILT1.Y0CEN2          287.2;
INS.FILT1.X0CEN3          257.4;      # r'
INS.FILT1.Y0CEN3          286.9;
INS.FILT1.X0CEN4            0.0;      # PV(B)
INS.FILT1.Y0CEN4            0.0;
INS.FILT1.X0CEN5          255.4;      # U
INS.FILT1.Y0CEN5          286.1;
INS.FILT1.X0CEN6          257.1;      # R
INS.FILT1.Y0CEN6          286.8;
INS.FILT1.X0CEN7            0.0;      # PV(V)
INS.FILT1.Y0CEN7            0.0;
INS.FILT1.X0CEN8          257.2;      # B
INS.FILT1.Y0CEN8          286.7;
INS.FILT1.X0CEN9          257.1;      # V
INS.FILT1.Y0CEN9          286.6;
INS.FILT1.X0CEN10         256.9;      # i'
```

```
INS.FILT1.Y0CEN10         286.7;
INS.FILT1.X0CEN11         257.1;      # I
INS.FILT1.Y0CEN11         286.8;
INS.FILT1.X0CEN12         257.5;      # z'
INS.FILT1.Y0CEN12         286.7;

#
# ADC for UVB band prism #1
#
INS.ADC1.DEVNAME       "adc1"; # Name of the ICS device
INS.ADC1.DEVDESC  "UVB ADC wheel #1"; # Description of the ICS device
INS.ADC1.LCUID              1; # Id. of the LCU managing the device
#INS.ADC1.INIALONE         F; # If T, initialise alone
INS.ADC1.SWSIM              F; # If T, function is software simulated

INS.ADC1.PERIOD         15000;
INS.ADC1.REFENC         54575;
INS.ADC1.MOTSIGN            1;
INS.ADC1.FORMULA            5;
INS.ADC1.MINELEV           30;
INS.ADC1.POSOFFST         180;
INS.ADC1.COFFSET        2.133;
INS.ADC1.PSLOPE           1.0;
INS.ADC1.POFFSET          750;
INS.ADC1.TSLOPE           1.0;
INS.ADC1.TOFFSET           10;
INS.ADC1.AFACTOR        3.695;
INS.ADC1.DROTFACT           0; # use 2 or -2 if derotator is present
INS.ADC1.SPDMIN           0.1;
INS.ADC1.SPDMAX             0;
INS.ADC1.OFFENC         36575;

# used by OS status panel (shopanStatus)
INS.ADC1.STUIFPOS          3;

#
# ADC for UVB band prism #2
#
INS.ADC2.DEVNAME       "adc2"; # Name of the ICS device
INS.ADC2.DEVDESC  "UVB ADC wheel #2"; # Description of the ICS device
INS.ADC2.LCUID              1; # Id. of the LCU managing the device
#INS.ADC2.INIALONE         F; # If T, initialise alone
INS.ADC2.SWSIM              F; # If T, function is software simulated

INS.ADC2.PERIOD         15000;
INS.ADC2.REFENC         19095;
INS.ADC2.MOTSIGN            1;
INS.ADC2.FORMULA            6;
INS.ADC2.MINELEV           30;
INS.ADC2.POSOFFST         180;
INS.ADC2.COFFSET        2.133;
INS.ADC2.PSLOPE           1.0;
INS.ADC2.POFFSET          750;
INS.ADC2.TSLOPE           1.0;
INS.ADC2.TOFFSET           10;
INS.ADC2.AFACTOR        3.695;
INS.ADC2.DROTFACT           0; # use 2 or -2 if derotator is present
INS.ADC2.SPDMIN           0.1;
INS.ADC2.SPDMAX             0;
INS.ADC2.OFFENC         37095;

# used by OS status panel (shopanStatus)
INS.ADC2.STUIFPOS          3;

#
# ADC for VIS band prism #1
#
INS.ADC3.DEVNAME       "adc3"; # Name of the ICS device
INS.ADC3.DEVDESC  "VIS ADC wheel #1"; # Description of the ICS device
INS.ADC3.LCUID              1; # Id. of the LCU managing the device
#INS.ADC3.INIALONE         F; # If T, initialise alone
INS.ADC3.SWSIM              F; # If T, function is software simulated

INS.ADC3.PERIOD         15000;
INS.ADC3.REFENC         54287;
```

```
INS.ADC3.MOTSIGN            1;
INS.ADC3.FORMULA            7;
INS.ADC3.MINELEV           30;
INS.ADC3.POSOFFST         180;
INS.ADC3.COFFSET        0.571;
INS.ADC3.PSLOPE           1.0;
INS.ADC3.POFFSET          750;
INS.ADC3.TSLOPE           1.0;
INS.ADC3.TOFFSET           10;
INS.ADC3.AFACTOR        0.989;
INS.ADC3.DROTFACT           0; # use 2 or -2 if derotator is present
INS.ADC3.SPDMIN           0.1;
INS.ADC3.SPDMAX             0;
INS.ADC3.OFFENC         36287;

# used by OS status panel (shopanStatus)
INS.ADC3.STUIFPOS           3;

#
# ADC for VIS band prism #2
#
INS.ADC4.DEVNAME       "adc4"; # Name of the ICS device
INS.ADC4.DEVDESC  "VIS ADC wheel #2"; # Description of the ICS device
INS.ADC4.LCUID              1; # Id. of the LCU managing the device
#INS.ADC4.INIALONE         F; # If T, initialise alone
INS.ADC4.SWSIM              F; # If T, function is software simulated

INS.ADC4.PERIOD         15000;
INS.ADC4.REFENC         17087;
INS.ADC4.MOTSIGN            1;
INS.ADC4.FORMULA            8;
INS.ADC4.MINELEV           30;
INS.ADC4.POSOFFST         180;
INS.ADC4.COFFSET        0.571;
INS.ADC4.PSLOPE           1.0;
INS.ADC4.POFFSET          750;
INS.ADC4.TSLOPE           1.0;
INS.ADC4.TOFFSET           10;
INS.ADC4.AFACTOR        0.989;
INS.ADC4.DROTFACT           0; # use 2 or -2 if derotator is present
INS.ADC4.SPDMIN           0.1;
INS.ADC4.SPDMAX             0;
INS.ADC4.OFFENC         35087;

# used by OS status panel (shopanStatus)
INS.ADC4.STUIFPOS           3;


#
# Temperature monitoring system
#
INS.SENSOR1.DEVNAME       "tms"; # Name of the ICS device
INS.SENSOR1.DEVDESC "Temperatures"; # Description of the ICS device
INS.SENSOR1.DEVTYPE    "ESTERS"; # Device type
INS.SENSOR1.LCUID             2; # Id. of the LCU managing the device
INS.SENSOR1.SWSIM             F; # If T, function is software simulated

INS.SENSOR1.PORT       "/iser2";
INS.SENSOR1.NUM                    11;

INS.SENSOR1.NAME1          "TMUC";
INS.SENSOR1.DESC1  "UVB Camera temp.";
INS.SENSOR1.HEADER1           T;
INS.SENSOR1.FITS1 "INS.TEMP1.VAL";
INS.SENSOR1.SENUNIT1        "C";
INS.SENSOR1.SENADDR1         100; # Sensor value hardware address
INS.SENSOR1.LOG1              T;

# used by OS status panel (shopanStatus)
INS.SENSOR1.STUIFPOS1        7;
INS.SENSOR1.UIFLEDMIN1       0;
INS.SENSOR1.UIFLEDMAX1    0.99;
INS.SENSOR1.UIFLEDCWP1     "<alias>tmpos0Alarm.tmsAlarm0";

# used to set alarm ranges (see shiInsToDb.tcl)
```

```
INS.SENSOR1.ALRMCWP1       "<alias>tmpos0Alarm";
INS.SENSOR1.ALRMMIN1            0;
INS.SENSOR1.ALRMMAX1           20;
# warning: possible sensor malfunction


INS.SENSOR1.NAME2        "TMUP";
INS.SENSOR1.DESC2   "UVB Prism temp.";
INS.SENSOR1.HEADER2           T;
INS.SENSOR1.FITS2 "INS.TEMP2.VAL";
INS.SENSOR1.SENUNIT2        "C";
INS.SENSOR1.SENADDR2        101; # Sensor value hardware address
INS.SENSOR1.LOG2             T;

# used by OS status panel (shopanStatus)
INS.SENSOR1.STUIFPOS2        7;
INS.SENSOR1.UIFLEDMIN2         0;
INS.SENSOR1.UIFLEDMAX2     0.99;
INS.SENSOR1.UIFLEDCWP2     "<alias>tmpos1Alarm.tmsAlarm1";

# used to set alarm ranges (see shiInsToDb.tcl)
INS.SENSOR1.ALRMCWP2       "<alias>tmpos1Alarm";
INS.SENSOR1.ALRMMIN2            0;
INS.SENSOR1.ALRMMAX2           20;


INS.SENSOR1.NAME3        "TMUB";
INS.SENSOR1.DESC3   "UVB bench temp.";
INS.SENSOR1.HEADER3           T;
INS.SENSOR1.FITS3    "INS.TEMP3.VAL";
INS.SENSOR1.SENUNIT3        "C";
INS.SENSOR1.SENADDR3        102; # Sensor value hardware address
INS.SENSOR1.LOG3              T;

# used by OS status panel (shopanStatus)
INS.SENSOR1.STUIFPOS3        7;
INS.SENSOR1.UIFLEDMIN3         0;
INS.SENSOR1.UIFLEDMAX3     0.99;
INS.SENSOR1.UIFLEDCWP3     "<alias>tmpos2Alarm.tmsAlarm2";

# used to set alarm ranges (see shiInsToDb.tcl)
INS.SENSOR1.ALRMCWP3       "<alias>tmpos2Alarm";
INS.SENSOR1.ALRMMIN3            0;
INS.SENSOR1.ALRMMAX3           20;

INS.SENSOR1.NAME4        "TMVC";
INS.SENSOR1.DESC4 "VIS Camera temp.";
INS.SENSOR1.HEADER4           T;
INS.SENSOR1.FITS4 "INS.TEMP4.VAL";
INS.SENSOR1.SENUNIT4        "C";
INS.SENSOR1.SENADDR4        104; # Sensor value hardware address
INS.SENSOR1.LOG4              T;

# used by OS status panel (shopanStatus)
INS.SENSOR1.STUIFPOS4        7;
INS.SENSOR1.UIFLEDMIN4         0;
INS.SENSOR1.UIFLEDMAX4     0.99;
INS.SENSOR1.UIFLEDCWP4     "<alias>tmpos3Alarm.tmsAlarm3";

# used to set alarm ranges (see shiInsToDb.tcl)
INS.SENSOR1.ALRMCWP4       "<alias>tmpos3Alarm";
INS.SENSOR1.ALRMMIN4            0;
INS.SENSOR1.ALRMMAX4           20;

INS.SENSOR1.NAME5        "TMVP";
INS.SENSOR1.DESC5   "VIS Prism temp.";
INS.SENSOR1.HEADER5           T;
INS.SENSOR1.FITS5 "INS.TEMP5.VAL";
INS.SENSOR1.SENUNIT5        "C";
INS.SENSOR1.SENADDR5        105; # Sensor value hardware address
INS.SENSOR1.LOG5              T;

# used by OS status panel (shopanStatus)
INS.SENSOR1.STUIFPOS5        7;
INS.SENSOR1.UIFLEDMIN5         0;
```

```
INS.SENSOR1.UIFLEDMAX5     0.99;
INS.SENSOR1.UIFLEDCWP5     "<alias>tmpos4Alarm.tmsAlarm4";

# used to set alarm ranges (see shiInsToDb.tcl)
INS.SENSOR1.ALRMCWP5       "<alias>tmpos4Alarm";
INS.SENSOR1.ALRMMIN5            0;
INS.SENSOR1.ALRMMAX5           20;


INS.SENSOR1.NAME6        "TMVB";
INS.SENSOR1.DESC6 "VIS bench temp.";
INS.SENSOR1.HEADER6           T;
INS.SENSOR1.FITS6 "INS.TEMP6.VAL";
INS.SENSOR1.SENUNIT6        "C";
INS.SENSOR1.SENADDR6        106; # Sensor value hardware address
INS.SENSOR1.LOG6              T;

# used by OS status panel (shopanStatus)
INS.SENSOR1.STUIFPOS6        7;
INS.SENSOR1.UIFLEDMIN6        0;
INS.SENSOR1.UIFLEDMAX6     0.99;
INS.SENSOR1.UIFLEDCWP6     "<alias>tmpos5Alarm.tmsAlarm5";

# used to set alarm ranges (see shiInsToDb.tcl)
INS.SENSOR1.ALRMCWP6       "<alias>tmpos5Alarm";
INS.SENSOR1.ALRMMIN6            0;
INS.SENSOR1.ALRMMAX6           20;


INS.SENSOR1.NAME7         "TMUCR";
INS.SENSOR1.DESC7    "UVB cryo. temp.";
INS.SENSOR1.HEADER7           T;
INS.SENSOR1.FITS7 "INS.TEMP7.VAL";
INS.SENSOR1.SENUNIT7        "C";
INS.SENSOR1.SENADDR7        107; # Sensor value hardware address
INS.SENSOR1.LOG7              T;

# used by OS status panel (shopanStatus)
INS.SENSOR1.STUIFPOS7        4;
INS.SENSOR1.UIFLEDMIN7        0;
INS.SENSOR1.UIFLEDMAX7     0.99;
INS.SENSOR1.UIFLEDCWP7     "<alias>tmpos6Alarm.tmsAlarm6";

# used to set alarm ranges (see shiInsToDb.tcl)
INS.SENSOR1.ALRMCWP7       "<alias>tmpos6Alarm";
INS.SENSOR1.ALRMMIN7            0;
INS.SENSOR1.ALRMMAX7           20;


INS.SENSOR1.NAME8        "TMVCR";
INS.SENSOR1.DESC8 "VIS cryo. temp.";
INS.SENSOR1.HEADER8           T;
INS.SENSOR1.FITS8 "INS.TEMP8.VAL";
INS.SENSOR1.SENUNIT8        "C";
INS.SENSOR1.SENADDR8        108; # Sensor value hardware address
INS.SENSOR1.LOG8              T;

# used by OS status panel (shopanStatus)
INS.SENSOR1.STUIFPOS8        4;
INS.SENSOR1.UIFLEDMIN8        0;
INS.SENSOR1.UIFLEDMAX8     0.99;
INS.SENSOR1.UIFLEDCWP8     "<alias>tmpos7Alarm.tmsAlarm7";

# used to set alarm ranges (see shiInsToDb.tcl)
INS.SENSOR1.ALRMCWP8       "<alias>tmpos7Alarm";
INS.SENSOR1.ALRMMIN8            0;
INS.SENSOR1.ALRMMAX8           20;


INS.SENSOR1.NAME9         "TMNCR";
INS.SENSOR1.DESC9 "NIR cryo. temp.";
INS.SENSOR1.HEADER9           T;
INS.SENSOR1.FITS9 "INS.TEMP9.VAL";
INS.SENSOR1.SENUNIT9        "C";
INS.SENSOR1.SENADDR9        109; # Sensor value hardware address
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```
INS.SENSOR1.LOG9              T;

# used by OS status panel (shopanStatus)
INS.SENSOR1.STUIFPOS9        4;
INS.SENSOR1.UIFLEDMIN9        0;
INS.SENSOR1.UIFLEDMAX9     0.99;
INS.SENSOR1.UIFLEDCWP9     "<alias>tmpos8Alarm.tmsAlarm8";

# used to set alarm ranges (see shiInsToDb.tcl)
INS.SENSOR1.ALRMCWP9       "<alias>tmpos8Alarm";
INS.SENSOR1.ALRMMIN9            0;
INS.SENSOR1.ALRMMAX9           20;


INS.SENSOR1.NAME10        "TMA";
INS.SENSOR1.DESC10 "Ambient temp.";
INS.SENSOR1.HEADER10           T;
INS.SENSOR1.FITS10 "INS.TEMP10.VAL";
INS.SENSOR1.SENUNIT10        "C";
INS.SENSOR1.SENADDR10        110; # Sensor value hardware address
INS.SENSOR1.LOG10              T;


# used to set alarm ranges (see shiInsToDb.tcl)
INS.SENSOR1.ALRMCWP10       "<alias>tmpos9Alarm";
INS.SENSOR1.ALRMMIN10            0;
INS.SENSOR1.ALRMMAX10           20;


# used by OS status panel (shopanStatus)
INS.SENSOR1.STUIFPOS10      6;

INS.SENSOR1.NAME11         "TMADC";
INS.SENSOR1.DESC11 "BB UVB ADC temp.";
INS.SENSOR1.HEADER11           T;
INS.SENSOR1.FITS11 "INS.TEMP11.VAL";
INS.SENSOR1.SENUNIT11        "C";
INS.SENSOR1.SENADDR11        111; # Sensor value hardware address
INS.SENSOR1.LOG11              T;

# used by OS status panel (shopanStatus)
INS.SENSOR1.STUIFPOS11      6;
INS.SENSOR1.UIFLEDMIN11     0;
INS.SENSOR1.UIFLEDMAX11     0.99;
INS.SENSOR1.UIFLEDCWP11     "<alias>tmpos10Alarm.tmsAlarm10";


# used to set alarm ranges (see shiInsToDb.tcl)
INS.SENSOR1.ALRMCWP11       "<alias>tmpos10Alarm";
INS.SENSOR1.ALRMMIN11            0;
INS.SENSOR1.ALRMMAX11           20;

INS.SENSOR1.NAME12        "SPR1";
INS.SENSOR1.DESC12        "Spare";
INS.SENSOR1.HEADER12           T;
INS.SENSOR1.FITS12 "INS.TEMP12.VAL";
INS.SENSOR1.SENUNIT12        "C";
INS.SENSOR1.SENADDR12        113; # Sensor value hardware address


# used to store alarm ranges in the OLDB for the refocus mechanism
# see shiInsToDb.tcl and Xshooter User Manual
INS.UVBRFC.ALRMCWP          "<alias>focusUvbTemp";
INS.UVBRFC.ALRMMIN          -9.0;
INS.UVBRFC.ALRMMAX          39.0;
INS.UVBRFC.DEFTEMP          14.0;

INS.VISRFC.ALRMCWP          "<alias>focusVisTemp";
INS.VISRFC.ALRMMIN          -9.0;
INS.VISRFC.ALRMMAX          39.0;
INS.VISRFC.DEFTEMP          15.0;


#
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```
# Digital sensors 1
#
INS.SENSOR2.DEVNAME      "dis1"; # Name of the ICS device
INS.SENSOR2.DEVDESC  "Housekeep. Alarms 1"; # Description of the ICS device
INS.SENSOR2.DEVTYPE   "DIGITAL"; # Device type
INS.SENSOR2.LCUID             2; # Id. of the LCU managing the device
INS.SENSOR2.SWSIM             F; # If T, function is software simulated

INS.SENSOR2.PORT        "/men2";
INS.SENSOR2.PERIOD         1200;
INS.SENSOR2.NUM              24;


INS.SENSOR2.NAME1        "TLL";
INS.SENSOR2.DESC1       "Tank Low Level";
INS.SENSOR2.HEADER1           F;
INS.SENSOR2.FITS1 "INS.SENS1.STAT";
INS.SENSOR2.SIGBIT1           0;
INS.SENSOR2.SIGWIDTH1         1;
INS.SENSOR2.SIGLOW1           F;
INS.SENSOR2.SIGVAL010       "T";
INS.SENSOR2.SIGVAL011       "F";

# used by OS status panel (shopanStatus)
INS.SENSOR2.STUIFPOS1        9;
INS.SENSOR2.UIFLEDMIN1        0;
INS.SENSOR2.UIFLEDMAX1     0.99;
INS.SENSOR2.UIFLEDCWP1     "<alias>DIS1.disAlarm0";


INS.SENSOR2.NAME2          "VAL";
INS.SENSOR2.DESC2 "Vacuum Alarm";
INS.SENSOR2.HEADER2            F;
INS.SENSOR2.FITS2 "INS.SENS2.STAT";
INS.SENSOR2.SIGBIT2           1;
INS.SENSOR2.SIGWIDTH2         1;
INS.SENSOR2.SIGLOW2           F;
INS.SENSOR2.SIGVAL020       "T";
INS.SENSOR2.SIGVAL021       "F";
INS.SENSOR2.LOG2              T;

# used by OS status panel (shopanStatus)
INS.SENSOR2.STUIFPOS2        9;
INS.SENSOR2.UIFLEDMIN2  0;
INS.SENSOR2.UIFLEDMAX2  0.99;
INS.SENSOR2.UIFLEDCWP2  "<alias>DIS1.disAlarm1";

INS.SENSOR2.NAME3          "EMP";
INS.SENSOR2.DESC3 "Emergency Pumping";
INS.SENSOR2.HEADER3            F;
INS.SENSOR2.FITS3 "INS.SENS3.STAT";
INS.SENSOR2.SIGBIT3           2;
INS.SENSOR2.SIGWIDTH3         1;
INS.SENSOR2.SIGLOW3           F;
INS.SENSOR2.SIGVAL030       "ON";
INS.SENSOR2.SIGVAL031      "OFF";
INS.SENSOR2.LOG3               T;

# used by OS status panel (shopanStatus)
INS.SENSOR2.STUIFPOS3        9;
INS.SENSOR2.UIFLEDMIN3  0;
INS.SENSOR2.UIFLEDMAX3  0.99;
INS.SENSOR2.UIFLEDCWP3  "<alias>DIS1.disAlarm2";

INS.SENSOR2.NAME4          "NDTOR";
INS.SENSOR2.DESC4 "NIR CCD T Out";
INS.SENSOR2.HEADER4            F;
INS.SENSOR2.FITS4 "INS.SENS4.STAT";
INS.SENSOR2.SIGBIT4           3;
INS.SENSOR2.SIGWIDTH4         1;
INS.SENSOR2.SIGLOW4           F;
INS.SENSOR2.SIGVAL040       "T";
INS.SENSOR2.SIGVAL041       "F";

# used by OS status panel (shopanStatus)
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INS.SENSOR2.STUIFPOS4        9;
INS.SENSOR2.UIFLEDMIN4  0;
INS.SENSOR2.UIFLEDMAX4  0.99;
INS.SENSOR2.UIFLEDCWP4  "<alias>DIS1.disAlarm3";

INS.SENSOR2.NAME5          "OBTOR";
INS.SENSOR2.DESC5 "OB T Out of Range";
INS.SENSOR2.HEADER5            F;
INS.SENSOR2.FITS5 "INS.SENS5.STAT";
INS.SENSOR2.SIGBIT5           4;
INS.SENSOR2.SIGWIDTH5         1;
INS.SENSOR2.SIGLOW5           F;
INS.SENSOR2.SIGVAL050       "T";
INS.SENSOR2.SIGVAL051       "F";

# used by OS status panel (shopanStatus)
INS.SENSOR2.STUIFPOS5        9;
INS.SENSOR2.UIFLEDMIN5  0;
INS.SENSOR2.UIFLEDMAX5  0.99;
INS.SENSOR2.UIFLEDCWP5  "<alias>DIS1.disAlarm4";

INS.SENSOR2.NAME6          "CTOOR";
INS.SENSOR2.DESC6 "Cryo. T Out of Range";
INS.SENSOR2.HEADER6            F;
INS.SENSOR2.FITS6 "INS.SENS6.STAT";
INS.SENSOR2.SIGBIT6           5;
INS.SENSOR2.SIGWIDTH6         1;
INS.SENSOR2.SIGLOW6           F;
INS.SENSOR2.SIGVAL060       "T";
INS.SENSOR2.SIGVAL061       "F";

# used by OS status panel (shopanStatus)
INS.SENSOR2.STUIFPOS6        9;
INS.SENSOR2.UIFLEDMIN6  0;
INS.SENSOR2.UIFLEDMAX6  0.99;
INS.SENSOR2.UIFLEDCWP6  "<alias>DIS1.disAlarm5";


INS.SENSOR2.NAME7          "CPF";
INS.SENSOR2.DESC7 "Cabinet Power Fail.";
INS.SENSOR2.HEADER7            F;
INS.SENSOR2.FITS7 "INS.SENS7.STAT";
INS.SENSOR2.SIGBIT7           6;
INS.SENSOR2.SIGWIDTH7         1;
INS.SENSOR2.SIGLOW7           F;
INS.SENSOR2.SIGVAL070       "T";
INS.SENSOR2.SIGVAL071       "F";

# used by OS status panel (shopanStatus)
INS.SENSOR2.STUIFPOS7        9;
INS.SENSOR2.UIFLEDMIN7  0;
INS.SENSOR2.UIFLEDMAX7  0.99;
INS.SENSOR2.UIFLEDCWP7  "<alias>DIS1.disAlarm6";

INS.SENSOR2.NAME8          "SPR";
INS.SENSOR2.DESC8        "Spare";
INS.SENSOR2.HEADER8            F;
INS.SENSOR2.FITS8 "INS.SENS8.STAT";
INS.SENSOR2.SIGBIT8           7;
INS.SENSOR2.SIGWIDTH8         1;
INS.SENSOR2.SIGLOW8           F;
INS.SENSOR2.SIGVAL080       "T";
INS.SENSOR2.SIGVAL081       "F";

#INS.SENSOR2.STUIFPOS8       6;

INS.SENSOR2.NAME9          "BVAC";
INS.SENSOR2.DESC9   "Vacuum Alarm";
INS.SENSOR2.HEADER9            F;
INS.SENSOR2.FITS9 "INS.SENS9.STAT";
INS.SENSOR2.SIGBIT9           8;
INS.SENSOR2.SIGWIDTH9         1;
INS.SENSOR2.SIGLOW9           F;
INS.SENSOR2.SIGVAL090        "F";
INS.SENSOR2.SIGVAL091        "T";
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INS.SENSOR2.LOG9               T;

# used by OS status panel (shopanStatus)
INS.SENSOR2.STUIFPOS9        9;
INS.SENSOR2.UIFLEDMIN9  0;
INS.SENSOR2.UIFLEDMAX9  0.99;
INS.SENSOR2.UIFLEDCWP9  "<alias>DIS1.disAlarm8";

INS.SENSOR2.NAME10          "DTVW";
INS.SENSOR2.DESC10 "Delta T Vessel Alarm";
INS.SENSOR2.HEADER10            F;
INS.SENSOR2.FITS10 "INS.SENS10.STAT";
INS.SENSOR2.SIGBIT10           9;
INS.SENSOR2.SIGWIDTH10         1;
INS.SENSOR2.SIGLOW10           F;
INS.SENSOR2.SIGVAL100       "F";
INS.SENSOR2.SIGVAL101       "T";

# used by OS status panel (shopanStatus)
INS.SENSOR2.STUIFPOS10       9;
INS.SENSOR2.UIFLEDMIN10   0;
INS.SENSOR2.UIFLEDMAX10   0.99;
INS.SENSOR2.UIFLEDCWP10   "<alias>DIS1.disAlarm9";

INS.SENSOR2.NAME11          "EVTBS";
INS.SENSOR2.DESC11 "Evac. TMP Bad Speed";
INS.SENSOR2.HEADER11            F;
INS.SENSOR2.FITS11 "INS.SENS11.STAT";
INS.SENSOR2.SIGBIT11          10;
INS.SENSOR2.SIGWIDTH11         1;
INS.SENSOR2.SIGLOW11           F;
INS.SENSOR2.SIGVAL110       "F";
INS.SENSOR2.SIGVAL111       "T";

# used by OS status panel (shopanStatus)
INS.SENSOR2.STUIFPOS11       9;
INS.SENSOR2.UIFLEDMIN11   0;
INS.SENSOR2.UIFLEDMAX11   0.99;
INS.SENSOR2.UIFLEDCWP11   "<alias>DIS1.disAlarm10";

INS.SENSOR2.NAME12          "EMTBS";
INS.SENSOR2.DESC12 "Emerg. TMP Bad Spd";
INS.SENSOR2.HEADER12            F;
INS.SENSOR2.FITS12 "INS.SENS12.STAT";
INS.SENSOR2.SIGBIT12           11;
INS.SENSOR2.SIGWIDTH12         1;
INS.SENSOR2.SIGLOW12           F;
INS.SENSOR2.SIGVAL120       "F";
INS.SENSOR2.SIGVAL121       "T";

# used by OS status panel (shopanStatus)
INS.SENSOR2.STUIFPOS12       9;
INS.SENSOR2.UIFLEDMIN12   0;
INS.SENSOR2.UIFLEDMAX12   0.99;
INS.SENSOR2.UIFLEDCWP12   "<alias>DIS1.disAlarm11";

INS.SENSOR2.NAME13          "C1DO";
INS.SENSOR2.DESC13 "Cab. 1 Doors Open";
INS.SENSOR2.HEADER13            F;
INS.SENSOR2.FITS13 "INS.SENS13.STAT";
INS.SENSOR2.SIGBIT13          12;
INS.SENSOR2.SIGWIDTH13         1;
INS.SENSOR2.SIGLOW13           F;
INS.SENSOR2.SIGVAL130       "OPEN";
INS.SENSOR2.SIGVAL131      "CLOSE";

# used by OS status panel (shopanStatus)
INS.SENSOR2.STUIFPOS13       6;
INS.SENSOR2.UIFLEDMIN13   0;
INS.SENSOR2.UIFLEDMAX13   0.99;
INS.SENSOR2.UIFLEDCWP13   "<alias>DIS1.disAlarm12";

INS.SENSOR2.NAME14          "C2DO";
INS.SENSOR2.DESC14 "Cab. 2 Doors Open";
INS.SENSOR2.HEADER14            F;
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INS.SENSOR2.FITS14 "INS.SENS14.STAT";
INS.SENSOR2.SIGBIT14          13;
INS.SENSOR2.SIGWIDTH14         1;
INS.SENSOR2.SIGLOW14           F;
INS.SENSOR2.SIGVAL140     "CLOSE";
INS.SENSOR2.SIGVAL141     "OPEN";

# used by OS status panel (shopanStatus)
INS.SENSOR2.STUIFPOS14      6;
INS.SENSOR2.UIFLEDMIN14   0;
INS.SENSOR2.UIFLEDMAX14   0.99;
INS.SENSOR2.UIFLEDCWP14   "<alias>DIS1.disAlarm13";

INS.SENSOR2.NAME15          "SPR1";
INS.SENSOR2.DESC15        "SPARE";
INS.SENSOR2.HEADER15            F;
INS.SENSOR2.FITS15 "INS.SENS15.STAT";
INS.SENSOR2.SIGBIT15          14;
INS.SENSOR2.SIGWIDTH15         1;
INS.SENSOR2.SIGLOW15           F;
INS.SENSOR2.SIGVAL150      "OPEN";
INS.SENSOR2.SIGVAL151     "CLOSE";
#INS.SENSOR2.STUIFPOS15      6;


INS.SENSOR2.NAME16          "SPR2";
INS.SENSOR2.DESC16        "SPARE";
INS.SENSOR2.HEADER16            F;
INS.SENSOR2.FITS16 "INS.SENS16.STAT";
INS.SENSOR2.SIGBIT16          15;
INS.SENSOR2.SIGWIDTH16         1;
INS.SENSOR2.SIGLOW16           F;
INS.SENSOR2.SIGVAL160     "OPEN";
INS.SENSOR2.SIGVAL161     "CLOSE";
#INS.SENSOR2.STUIFPOS16      6;

INS.SENSOR2.NAME17          "CD";
INS.SENSOR2.DESC17   "Cool Down";
INS.SENSOR2.HEADER17            F;
INS.SENSOR2.FITS17 "INS.SENS17.STAT";
INS.SENSOR2.SIGBIT17          16;
INS.SENSOR2.SIGWIDTH17         1;
INS.SENSOR2.SIGLOW17           F;
INS.SENSOR2.SIGVAL170        "T";
INS.SENSOR2.SIGVAL171        "F";

# used by OS status panel (shopanStatus)
INS.SENSOR2.STUIFPOS17       9;
INS.SENSOR2.UIFLEDMIN17   0;
INS.SENSOR2.UIFLEDMAX17   0.99;
INS.SENSOR2.UIFLEDCWP17   "<alias>DIS1.disAlarm16";

INS.SENSOR2.NAME18          "EM";
INS.SENSOR2.DESC18   "Evacuation Mode";
INS.SENSOR2.HEADER18            F;
INS.SENSOR2.FITS18 "INS.SENS18.STAT";
INS.SENSOR2.SIGBIT18          17;
INS.SENSOR2.SIGWIDTH18         1;
INS.SENSOR2.SIGLOW18           F;
INS.SENSOR2.SIGVAL180        "T";
INS.SENSOR2.SIGVAL181        "F";

# used by OS status panel (shopanStatus)
INS.SENSOR2.STUIFPOS18       9;
INS.SENSOR2.UIFLEDMIN18   0;
INS.SENSOR2.UIFLEDMAX18   0.99;
INS.SENSOR2.UIFLEDCWP18   "<alias>DIS1.disAlarm17";

INS.SENSOR2.NAME19          "TR";
INS.SENSOR2.DESC19   "Tank Refill";
INS.SENSOR2.HEADER19            F;
INS.SENSOR2.FITS19 "INS.SENS19.STAT";
INS.SENSOR2.SIGBIT19          18;
INS.SENSOR2.SIGWIDTH19         1;
INS.SENSOR2.SIGLOW19           F;
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INS.SENSOR2.SIGVAL190        "T";
INS.SENSOR2.SIGVAL191        "F";

# used by OS status panel (shopanStatus)
INS.SENSOR2.STUIFPOS19       9;
INS.SENSOR2.UIFLEDMIN19   0;
INS.SENSOR2.UIFLEDMAX19   0.99;
INS.SENSOR2.UIFLEDCWP19   "<alias>DIS1.disAlarm18";

INS.SENSOR2.NAME20          "WU";
INS.SENSOR2.DESC20     "Warm-Up";
INS.SENSOR2.HEADER20           F;
INS.SENSOR2.FITS20 "INS.SENS20.STAT";
INS.SENSOR2.SIGBIT20          19;
INS.SENSOR2.SIGWIDTH20         1;
INS.SENSOR2.SIGLOW20           F;
INS.SENSOR2.SIGVAL200        "T";
INS.SENSOR2.SIGVAL201        "F";

# used by OS status panel (shopanStatus)
INS.SENSOR2.STUIFPOS20       9;
INS.SENSOR2.UIFLEDMIN20   0;
INS.SENSOR2.UIFLEDMAX20   0.99;
INS.SENSOR2.UIFLEDCWP20   "<alias>DIS1.disAlarm19";

INS.SENSOR2.NAME21          "RP";
INS.SENSOR2.DESC21     "Re-Pressurization";
INS.SENSOR2.HEADER21           F;
INS.SENSOR2.FITS21 "INS.SENS21.STAT";
INS.SENSOR2.SIGBIT21          20;
INS.SENSOR2.SIGWIDTH21         1;
INS.SENSOR2.SIGLOW21           F;
INS.SENSOR2.SIGVAL210        "T";
INS.SENSOR2.SIGVAL211        "F";

# used by OS status panel (shopanStatus)
INS.SENSOR2.STUIFPOS21       9;
INS.SENSOR2.UIFLEDMIN21   0;
INS.SENSOR2.UIFLEDMAX21   0.99;
INS.SENSOR2.UIFLEDCWP21   "<alias>DIS1.disAlarm20";

INS.SENSOR2.NAME22        "EPBA";
INS.SENSOR2.DESC22     "Emerg. Button Active";
INS.SENSOR2.HEADER22           F;
INS.SENSOR2.FITS22 "INS.SENS22.STAT";
INS.SENSOR2.SIGBIT22          21;
INS.SENSOR2.SIGWIDTH22         1;
INS.SENSOR2.SIGLOW22           F;
INS.SENSOR2.SIGVAL220        "T";
INS.SENSOR2.SIGVAL221        "F";

# used by OS status panel (shopanStatus)
INS.SENSOR2.STUIFPOS22       9;
INS.SENSOR2.UIFLEDMIN22   0;
INS.SENSOR2.UIFLEDMAX22   0.99;
INS.SENSOR2.UIFLEDCWP22   "<alias>DIS1.disAlarm21";

INS.SENSOR2.NAME23          "AZIO";
INS.SENSOR2.DESC23     "Azimuth Interlock On";
INS.SENSOR2.HEADER23           F;
INS.SENSOR2.FITS23 "INS.SENS23.STAT";
INS.SENSOR2.SIGBIT23          22;
INS.SENSOR2.SIGWIDTH23         1;
INS.SENSOR2.SIGLOW23           F;
INS.SENSOR2.SIGVAL230        "T";
INS.SENSOR2.SIGVAL231        "F";

# used by OS status panel (shopanStatus)
INS.SENSOR2.STUIFPOS23       6;
INS.SENSOR2.UIFLEDMIN23   0;
INS.SENSOR2.UIFLEDMAX23   0.99;
INS.SENSOR2.UIFLEDCWP23   "<alias>DIS1.disAlarm22";

INS.SENSOR2.NAME24          "ALIO";
INS.SENSOR2.DESC24     "Altitude Interlock On";
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```
INS.SENSOR2.HEADER24            F;
INS.SENSOR2.FITS24 "INS.SENS24.STAT";
INS.SENSOR2.SIGBIT24          23;
INS.SENSOR2.SIGWIDTH24         1;
INS.SENSOR2.SIGLOW24           F;
INS.SENSOR2.SIGVAL240        "T";
INS.SENSOR2.SIGVAL241        "F";

# used by OS status panel (shopanStatus)
INS.SENSOR2.STUIFPOS24       6;
INS.SENSOR2.UIFLEDMIN24   0;
INS.SENSOR2.UIFLEDMAX24   0.99;
INS.SENSOR2.UIFLEDCWP24   "<alias>DIS1.disAlarm23";


#
# Digital sensors 2
#
INS.SENSOR3.DEVNAME      "dis2"; # Name of the ICS device
INS.SENSOR3.DEVDESC  "Housekeep. Alarms 2"; # Description of the ICS device
INS.SENSOR3.DEVTYPE   "DIGITAL"; # Device type
INS.SENSOR3.LCUID             2; # Id. of the LCU managing the device
INS.SENSOR3.SWSIM             F; # If T, function is software simulated

INS.SENSOR3.PORT        "/men3";
INS.SENSOR3.PERIOD         1200;
INS.SENSOR3.NUM              12;

INS.SENSOR3.NAME1          "EPO";
INS.SENSOR3.DESC1  "Evac. Pumps";
INS.SENSOR3.HEADER1            F;
INS.SENSOR3.FITS1 "INS.SENS25.STAT";
INS.SENSOR3.SIGBIT1            0;
INS.SENSOR3.SIGWIDTH1          1;
INS.SENSOR3.SIGLOW1            F;
INS.SENSOR3.SIGVAL010      "OFF";
INS.SENSOR3.SIGVAL011      "ON";

# used by OS status panel (shopanStatus)
INS.SENSOR3.STUIFPOS1        9;
INS.SENSOR3.UIFLEDMIN1   0;
INS.SENSOR3.UIFLEDMAX1   0.99;
INS.SENSOR3.UIFLEDCWP1   "<alias>DIS2.dis2Alarm0";

INS.SENSOR3.NAME2          "EVO";
INS.SENSOR3.DESC2  "Evac. Valve";
INS.SENSOR3.HEADER2            F;
INS.SENSOR3.FITS2 "INS.SENS26.STAT";
INS.SENSOR3.SIGBIT2            1;
INS.SENSOR3.SIGWIDTH2          1;
INS.SENSOR3.SIGLOW2            F;
INS.SENSOR3.SIGVAL020    "CLOSE";
INS.SENSOR3.SIGVAL021    "OPEN";

# used by OS status panel (shopanStatus)
INS.SENSOR3.STUIFPOS2        9;
INS.SENSOR3.UIFLEDMIN2   0;
INS.SENSOR3.UIFLEDMAX2   0.99;
INS.SENSOR3.UIFLEDCWP2   "<alias>DIS2.dis2Alarm1";

INS.SENSOR3.NAME3          "PVO";
INS.SENSOR3.DESC3  "Precool Valve";
INS.SENSOR3.HEADER3            F;
INS.SENSOR3.FITS3 "INS.SENS27.STAT";
INS.SENSOR3.SIGBIT3            2;
INS.SENSOR3.SIGWIDTH3          1;
INS.SENSOR3.SIGLOW3            F;
INS.SENSOR3.SIGVAL030    "CLOSE";
INS.SENSOR3.SIGVAL031    "OPEN";

# used by OS status panel (shopanStatus)
INS.SENSOR3.STUIFPOS3        9;
#INS.SENSOR3.UIFLEDMIN3   0;
#INS.SENSOR3.UIFLEDMAX3   0.99;
#INS.SENSOR3.UIFLEDCWP3   "<alias>DIS2.dis2Alarm2";
```

```
INS.SENSOR3.NAME4        "SPR3";
INS.SENSOR3.DESC4       "Spare";
INS.SENSOR3.HEADER4           F;
INS.SENSOR3.FITS4 "INS.SENS28.STAT";
INS.SENSOR3.SIGBIT4           3;
INS.SENSOR3.SIGWIDTH4         1;
INS.SENSOR3.SIGLOW4           F;
INS.SENSOR3.SIGVAL040     "OPEN";
INS.SENSOR3.SIGVAL041    "CLOSE";
#INS.SENSOR3.STUIFPOS4       6;

INS.SENSOR3.NAME5         "RVO";
INS.SENSOR3.DESC5  "Refill Valve";
INS.SENSOR3.HEADER5           F;
INS.SENSOR3.FITS5 "INS.SENS29.STAT";
INS.SENSOR3.SIGBIT5           4;
INS.SENSOR3.SIGWIDTH5         1;
INS.SENSOR3.SIGLOW5           F;
INS.SENSOR3.SIGVAL050     "CLOSE";
INS.SENSOR3.SIGVAL051     "OPEN";

# used by OS status panel (shopanStatus)
INS.SENSOR3.STUIFPOS5        9;
INS.SENSOR3.UIFLEDMIN5   0;
INS.SENSOR3.UIFLEDMAX5   0.99;
INS.SENSOR3.UIFLEDCWP5   "<alias>DIS2.dis2Alarm4";

INS.SENSOR3.NAME6         "N2TF";
INS.SENSOR3.DESC6  "N2 Tank Full";
INS.SENSOR3.HEADER6           F;
INS.SENSOR3.FITS6 "INS.SENS30.STAT";
INS.SENSOR3.SIGBIT6           5;
INS.SENSOR3.SIGWIDTH6         1;
INS.SENSOR3.SIGLOW6           F;
INS.SENSOR3.SIGVAL060       "F";
INS.SENSOR3.SIGVAL061       "T";

# used by OS status panel (shopanStatus)
INS.SENSOR3.STUIFPOS6        9;
#INS.SENSOR3.UIFLEDMIN6   0;
#INS.SENSOR3.UIFLEDMAX6   0.99;
#INS.SENSOR3.UIFLEDCWP6   "<alias>DIS2.dis2Alarm5";

INS.SENSOR3.NAME7         "LSDTT";
INS.SENSOR3.DESC7  "LS Det. T Trigger";
INS.SENSOR3.HEADER7           F;
INS.SENSOR3.FITS7 "INS.SENS31.STAT";
INS.SENSOR3.SIGBIT7           6;
INS.SENSOR3.SIGWIDTH7         1;
INS.SENSOR3.SIGLOW7           F;
INS.SENSOR3.SIGVAL070       "F";
INS.SENSOR3.SIGVAL071       "T";

# used by OS status panel (shopanStatus)
INS.SENSOR3.STUIFPOS7        9;
#INS.SENSOR3.UIFLEDMIN7   0;
#INS.SENSOR3.UIFLEDMAX7   0.99;
#INS.SENSOR3.UIFLEDCWP7   "<alias>DIS2.dis2Alarm6";

INS.SENSOR3.NAME8         "LSSTT";
INS.SENSOR3.DESC8  "LS Stab. T Trigger";
INS.SENSOR3.HEADER8           F;
INS.SENSOR3.FITS8 "INS.SENS32.STAT";
INS.SENSOR3.SIGBIT8           7;
INS.SENSOR3.SIGWIDTH8         1;
INS.SENSOR3.SIGLOW8           F;
INS.SENSOR3.SIGVAL080       "F";
INS.SENSOR3.SIGVAL081       "T";

# used by OS status panel (shopanStatus)
INS.SENSOR3.STUIFPOS8        9;
#INS.SENSOR3.UIFLEDMIN8   0;
#INS.SENSOR3.UIFLEDMAX8   0.99;
#INS.SENSOR3.UIFLEDCWP8   "<alias>DIS2.dis2Alarm7";
```

```
INS.SENSOR3.NAME9         "OBTTT";
INS.SENSOR3.DESC9  "OB T Trigger";
INS.SENSOR3.HEADER9           F;
INS.SENSOR3.FITS9 "INS.SENS33.STAT";
INS.SENSOR3.SIGBIT9           8;
INS.SENSOR3.SIGWIDTH9         1;
INS.SENSOR3.SIGLOW9           F;
INS.SENSOR3.SIGVAL090       "F";
INS.SENSOR3.SIGVAL091       "T";

# used by OS status panel (shopanStatus)
INS.SENSOR3.STUIFPOS9        9;
#INS.SENSOR3.UIFLEDMIN9   0;
#INS.SENSOR3.UIFLEDMAX9   0.99;
#INS.SENSOR3.UIFLEDCWP9   "<alias>DIS2.dis2Alarm8";

INS.SENSOR3.NAME10         "WUP1";
INS.SENSOR3.DESC10  "Warm-Up Power 1";
INS.SENSOR3.HEADER10           F;
INS.SENSOR3.FITS10 "INS.SENS34.STAT";
INS.SENSOR3.SIGBIT10           9;
INS.SENSOR3.SIGWIDTH10         1;
INS.SENSOR3.SIGLOW10           F;
INS.SENSOR3.SIGVAL100       "OFF";
INS.SENSOR3.SIGVAL101       "ON";

# used by OS status panel (shopanStatus)
INS.SENSOR3.STUIFPOS10       9;
#INS.SENSOR3.UIFLEDMIN10   0;
#INS.SENSOR3.UIFLEDMAX10   0.99;
#INS.SENSOR3.UIFLEDCWP10   "<alias>DIS2.dis2Alarm9";

INS.SENSOR3.NAME11         "WUP2";
INS.SENSOR3.DESC11  "Warm-Up Power 2";
INS.SENSOR3.HEADER11           F;
INS.SENSOR3.FITS11 "INS.SENS35.STAT";
INS.SENSOR3.SIGBIT11          10;
INS.SENSOR3.SIGWIDTH11         1;
INS.SENSOR3.SIGLOW11           F;
INS.SENSOR3.SIGVAL110       "OFF";
INS.SENSOR3.SIGVAL111       "ON";

# used by OS status panel (shopanStatus)
INS.SENSOR3.STUIFPOS11        9;
#INS.SENSOR3.UIFLEDMIN11   0;
#INS.SENSOR3.UIFLEDMAX11   0.99;
#INS.SENSOR3.UIFLEDCWP11   "<alias>DIS2.dis2Alarm10";

INS.SENSOR3.NAME12         "WUP3";
INS.SENSOR3.DESC12  "Warm-Up Power 3";
INS.SENSOR3.HEADER12           F;
INS.SENSOR3.FITS12 "INS.SENS36.STAT";
INS.SENSOR3.SIGBIT12          11;
INS.SENSOR3.SIGWIDTH12         1;
INS.SENSOR3.SIGLOW12           F;
INS.SENSOR3.SIGVAL120       "OFF";
INS.SENSOR3.SIGVAL121       "ON";

# used by OS status panel (shopanStatus)
INS.SENSOR3.STUIFPOS12       9;
#INS.SENSOR3.UIFLEDMIN12   0;
#INS.SENSOR3.UIFLEDMAX12   0.99;
#INS.SENSOR3.UIFLEDCWP12   "<alias>DIS2.dis2Alarm11";


#
# Cabinet cooling controller sensor
#
INS.SENSOR4.DEVNAME      "ccc1"; # Name of the ICS device
INS.SENSOR4.DEVDESC "Cooling ctrl. 1"; # Description of the ICS device
INS.SENSOR4.DEVTYPE   "COOLING"; # Device type
INS.SENSOR4.LCUID             2; # Id. of the LCU managing the device
INS.SENSOR4.SWSIM             F; # If T, function is software simulated
```

```
INS.SENSOR4.PORT       "/iser3";
INS.SENSOR4.NUM                    5;

INS.SENSOR4.NAME1        "CA1OT";
INS.SENSOR4.DESC1 "Cab.1 outlet temp.";
INS.SENSOR4.HEADER1           T;
INS.SENSOR4.FITS1 "INS.TEMP21.VAL";
INS.SENSOR4.SENUNIT1        "C";
INS.SENSOR4.SENADDR1          1;
INS.SENSOR4.LOG1              T;

# used by OS status panel (shopanStatus)
INS.SENSOR4.STUIFPOS1       6;

INS.SENSOR4.NAME2        "CA1IT";
INS.SENSOR4.DESC2 "Cab.1 inlet temp.";
INS.SENSOR4.HEADER2           T;
INS.SENSOR4.FITS2 "INS.TEMP22.VAL";
INS.SENSOR4.SENUNIT2        "C";
INS.SENSOR4.SENADDR2          2;
INS.SENSOR4.LOG2              T;

# used by OS status panel (shopanStatus)
INS.SENSOR4.STUIFPOS2       6;

INS.SENSOR4.NAME3        "CA1CT";
INS.SENSOR4.DESC3  "Cab.1 temp.";
INS.SENSOR4.HEADER3           T;
INS.SENSOR4.FITS3 "INS.TEMP23.VAL";
INS.SENSOR4.SENUNIT3        "C";
INS.SENSOR4.SENADDR3          3;
INS.SENSOR4.LOG3              T;

# used by OS status panel (shopanStatus)
INS.SENSOR4.STUIFPOS3       6;

INS.SENSOR4.NAME4        "CA1AT";
INS.SENSOR4.DESC4 "Cab.1 Amb. temp.";
INS.SENSOR4.HEADER4           T;
INS.SENSOR4.FITS4 "INS.TEMP24.VAL";
INS.SENSOR4.SENUNIT4        "C";
INS.SENSOR4.SENADDR4          4;
INS.SENSOR1.LOG4              T;

# used by OS status panel (shopanStatus)
INS.SENSOR4.STUIFPOS4       6;

INS.SENSOR4.NAME5        "CA1F1";
INS.SENSOR4.DESC5 "Cab.1 Flow rate";
INS.SENSOR4.HEADER5           T;
INS.SENSOR4.FITS5 "INS.SENS21.VAL";
INS.SENSOR4.SENUNIT5      "l/h";
INS.SENSOR4.SENADDR5          6;
INS.SENSOR4.LOG5              T;

# used by OS status panel (shopanStatus)
INS.SENSOR4.STUIFPOS5       6;




#
# Cabinet cooling controller sensor
#
# INS.SENSOR5.DEVNAME      "ccc2"; # Name of the ICS device
# INS.SENSOR5.DEVDESC "Cooling ctrl. 2"; # Description of the ICS device
# INS.SENSOR5.DEVTYPE   "COOLING"; # Device type
# INS.SENSOR5.LCUID             2; # Id. of the LCU managing the device
# INS.SENSOR5.SWSIM             F; # If T, function is software simulated

# INS.SENSOR5.PORT       "/iser4";
# INS.SENSOR5.NUM                  5;

# INS.SENSOR5.NAME1        "CA2OT";
# INS.SENSOR5.DESC1 "Cab.2 outlet temp.";
```

```
# INS.SENSOR5.HEADER1           T;
# INS.SENSOR5.FITS1 "INS.TEMP60.VAL";
# INS.SENSOR5.SENUNIT1        "C";
# INS.SENSOR5.SENADDR1          1;
# INS.SENSOR5.STUIFPOS1       6;

# INS.SENSOR5.NAME2        "CA2IT";
# INS.SENSOR5.DESC2 "Cab.2 inlet temp.";
# INS.SENSOR5.HEADER2           T;
# INS.SENSOR5.FITS2 "INS.TEMP61.VAL";
# INS.SENSOR5.SENUNIT2        "C";
# INS.SENSOR5.SENADDR2          2;
# INS.SENSOR5.STUIFPOS2       6;

# INS.SENSOR5.NAME3        "CA2CT";
# INS.SENSOR5.DESC3 "Cab.2 temp.";
# INS.SENSOR5.HEADER3           T;
# INS.SENSOR5.FITS3 "INS.TEMP62.VAL";
# INS.SENSOR5.SENUNIT3        "C";
# INS.SENSOR5.SENADDR3          3;
# INS.SENSOR5.STUIFPOS3       6;

# INS.SENSOR5.NAME4        "CA2AT";
# INS.SENSOR5.DESC4 "Cab.2 Amb. temp.";
# INS.SENSOR5.HEADER4           T;
# INS.SENSOR5.FITS4 "INS.TEMP63.VAL";
# INS.SENSOR5.SENUNIT4        "C";
# INS.SENSOR5.SENADDR4          4;
# INS.SENSOR5.STUIFPOS4       6;

# INS.SENSOR5.NAME5        "CA2F1";
# INS.SENSOR5.DESC5 "Cab.2 Flow rate";
# INS.SENSOR5.HEADER5           T;
# INS.SENSOR5.FITS5 "INS.SENS31.VAL";
# INS.SENSOR5.SENUNIT5      "l/h";
# INS.SENSOR5.SENADDR5          5;
# INS.SENSOR5.STUIFPOS5       6;




#
# AFCS1 Special device
#
INS.FCTILT1.DEVNAME      "afcs1"; # Name of the ICS device
INS.FCTILT1.DEVDESC "Flexure comp. UVB"; # Description of the ICS device
INS.FCTILT1.PREFIX    "INS.TILT1"; # FITS prefix
INS.FCTILT1.DEVTYPE       "AFC"; # Device type
INS.FCTILT1.PROCNAME "shipztServer"; # Name of the LCU server process
INS.FCTILT1.LCUID             2; # Id. of the LCU managing the device
INS.FCTILT1.SWSIM             F; # If T, function is software simulated


INS.FCTILT1.PORTOUTX    "/men6"; # feedback X
INS.FCTILT1.CHOUTX            0; # channel for feedback X
INS.FCTILT1.PORTOUTY    "/men6"; # feedback Y
INS.FCTILT1.CHOUTY            1; # channel for feedback Y
INS.FCTILT1.PORTINX     "/men4"; # output voltage X
INS.FCTILT1.CHINX             0; # channel for output voltage X
INS.FCTILT1.PORTINY     "/men4"; # output voltage Y
INS.FCTILT1.CHINY             1; # channel for output voltage Y
INS.FCTILT1.VREFX           5.0; # reference voltage position (X)
INS.FCTILT1.VREFY           5.0; # reference voltage position (Y)
INS.FCTILT1.REFPOSX         5.0; # voltage for REF position (X)
INS.FCTILT1.REFPOSY         5.0; # voltage for REF position (Y)
INS.FCTILT1.PARKX          5.0; # voltage for PARK position (X)
INS.FCTILT1.PARKY          5.0; # voltage for PARK position (Y)
INS.FCTILT1.PORTDIG     "/men3"; # digital port to switch ampl. on
INS.FCTILT1.CHDIG            16; # bit for switching ampl. on

# during ESO integration it was decided to use just volt
INS.FCTILT1.UNIT2VX           4.808;
INS.FCTILT1.UNIT2VY           3.717;
INS.FCTILT1.V2UNITX           0.208;
```

```
INS.FCTILT1.V2UNITY           0.269;

INS.FCTILT1.LAMBDAR       0.405; # reference wavelength
INS.FCTILT1.LAMBDAT       0.470; # tracking wavelength

INS.FCTILT1.UIFCLASS     "shipanAFCS"
INS.FCTILT1.UIFSPECIAL          T

# used by OS status panel (shopanStatus)
INS.FCTILT1.STUIFPOS        3;

#
# AFCS2 Special device
#
INS.FCTILT2.DEVNAME      "afcs2"; # Name of the ICS device
INS.FCTILT2.DEVDESC "Flexure comp. VIS"; # Description of the ICS device
INS.FCTILT2.PREFIX    "INS.TILT2"; # FITS prefix
INS.FCTILT2.DEVTYPE         "AFC"; # Device type
INS.FCTILT2.PROCNAME "shipztServer"; # Name of the LCU server process
INS.FCTILT2.LCUID             2; # Id. of the LCU managing the device
INS.FCTILT2.SWSIM             F; # If T, function is software simulated

INS.FCTILT2.PORTOUTX     "/men6"; # feedback X
INS.FCTILT2.CHOUTX            2;  # channel for feedback X
INS.FCTILT2.PORTOUTY     "/men6"; # feedback Y
INS.FCTILT2.CHOUTY            3;  # channel for feedback Y
INS.FCTILT2.PORTINX      "/men4"; # output voltage X
INS.FCTILT2.CHINX             2;  # channel for output voltage X
INS.FCTILT2.PORTINY      "/men4"; # output voltage Y
INS.FCTILT2.CHINY             3;  # channel for output voltage Y
INS.FCTILT2.VREFX           5.0;  # reference voltage position (X)
INS.FCTILT2.VREFY           5.0;  # reference voltage position (Y)
INS.FCTILT2.REFPOSX         5.0;  # voltage for REF position (X)
INS.FCTILT2.REFPOSY         5.0;  # voltage for REF position (Y)
INS.FCTILT2.PARKX          5.0;  # voltage for PARK position (X)
INS.FCTILT2.PARKY          5.0;  # voltage for PARK position (Y)
INS.FCTILT2.PORTDIG     "/men3";  # digital port to switch ampl. on
INS.FCTILT2.CHDIG            17;  # bit for switching ampl. on

# during ESO integration it was decided to use just volt
INS.FCTILT2.UNIT2VX           3.136;
INS.FCTILT2.UNIT2VY           2.604;
INS.FCTILT2.V2UNITX           0.291;
INS.FCTILT2.V2UNITY           0.384;

INS.FCTILT2.LAMBDAR       0.633;  # reference wavelength
INS.FCTILT2.LAMBDAT       0.470;  # tracking wavelength

INS.FCTILT2.UIFCLASS     "shipanAFCS"
INS.FCTILT2.UIFSPECIAL          T

# used by OS status panel (shopanStatus)
INS.FCTILT2.STUIFPOS        3;

#
# AFCS3 Special device
#
INS.FCTILT3.DEVNAME      "afcs3"; # Name of the ICS device
INS.FCTILT3.DEVDESC "Flexure comp. NIR"; # Description of the ICS device
INS.FCTILT3.PREFIX    "INS.TILT3"; # FITS prefix
INS.FCTILT3.DEVTYPE         "AFC"; # Device type
INS.FCTILT3.PROCNAME "shipztServer"; # Name of the LCU server process
INS.FCTILT3.LCUID             2; # Id. of the LCU managing the device
INS.FCTILT3.SWSIM             F; # If T, function is software simulated

INS.FCTILT3.PORTOUTX     "/men6";  # feedback X
INS.FCTILT3.CHOUTX            4;   # channel for feedback X
INS.FCTILT3.PORTOUTY     "/men6";  # feedback Y
INS.FCTILT3.CHOUTY            5;   # channel for feedback Y
INS.FCTILT3.PORTINX      "/men5";  # output voltage X
INS.FCTILT3.CHINX             0;   # channel for output voltage X
INS.FCTILT3.PORTINY      "/men5";  # output voltage Y
INS.FCTILT3.CHINY             1;   # channel for output voltage Y
INS.FCTILT3.VREFX           5.0;  # reference voltage position (X)
INS.FCTILT3.VREFY           5.0;  # reference voltage position (Y)
```

```
INS.FCTILT3.REFPOSX          5.0;   # voltage for REF position (X)
INS.FCTILT3.REFPOSY          5.0;   # voltage for REF position (Y)
INS.FCTILT3.PARKX            5.0;   # voltage for PARK position (X)
INS.FCTILT3.PARKY            5.0;   # voltage for PARK position (Y)
INS.FCTILT3.PORTDIG     "/men3";   # digital port to switch ampl. on
INS.FCTILT3.CHDIG             18;   # bit for switching ampl. on

# during ESO integration it was decided to use just volt
INS.FCTILT3.UNIT2VX            1.71;
INS.FCTILT3.UNIT2VY            1.78;
INS.FCTILT3.V2UNITX            0.58;
INS.FCTILT3.V2UNITY            0.56;

INS.FCTILT3.LAMBDAR       1.310;   # reference wavelength
INS.FCTILT3.LAMBDAT       0.470;   # tracking wavelength

INS.FCTILT3.UIFCLASS     "shipanAFCS"
INS.FCTILT3.UIFSPECIAL           T

# used by OS status panel (shopanStatus)
INS.FCTILT3.STUIFPOS         3;

#
# Sample discrete positions function, linear axis
#
INS.OPTI3.DEVNAME      "bss"; # Name of the ICS device
INS.OPTI3.DEVDESC "UVB slit"; # Description of the ICS device
INS.OPTI3.LCUID              1; # Id. of the LCU managing the device
#INS.OPTI3.INIALONE        F; # If T, initialise alone
INS.OPTI3.SWSIM              F; # If T, function is software simulated


INS.OPTI3.POSNUM           9;
INS.OPTI3.POSID1         "PS1";
INS.OPTI3.POSID2         "PS2";
INS.OPTI3.POSID3         "PS3";
INS.OPTI3.POSID4         "PS4";
INS.OPTI3.POSID5         "PS5";
INS.OPTI3.POSID6         "PS6";
INS.OPTI3.POSID7         "PS7";
INS.OPTI3.POSID8         "PS8";
INS.OPTI3.POSID9         "PS9";


INS.OPTI3.ID1            "PS1";
INS.OPTI3.NAME1          "5.0x11";
INS.OPTI3.TYPE1         "SLIT"; # Element type
INS.OPTI3.ID2            "PS2";
INS.OPTI3.NAME2          "1.3x11";
INS.OPTI3.TYPE2         "SLIT"; # Element type
INS.OPTI3.ID3            "PS3";
INS.OPTI3.NAME3          "0.8x11";
INS.OPTI3.TYPE3         "SLIT"; # Element type
INS.OPTI3.ID4            "PS4";
INS.OPTI3.NAME4          "Pin_row";
INS.OPTI3.TYPE4         "SLIT"; # Element type
INS.OPTI3.ID5            "PS5";
INS.OPTI3.NAME5          "Pin_0.5";
INS.OPTI3.TYPE5         "SLIT"; # Element type
INS.OPTI3.ID6            "PS6";
INS.OPTI3.NAME6          "0.5x11";
INS.OPTI3.TYPE6         "SLIT"; # Element type
INS.OPTI3.ID7            "PS7";
INS.OPTI3.NAME7          "1.0x11";
INS.OPTI3.TYPE7         "SLIT"; # Element type
INS.OPTI3.ID8            "PS8";
INS.OPTI3.NAME8          "1.6x11";
INS.OPTI3.TYPE8         "SLIT"; # Element type
INS.OPTI3.ID9            "PS9";
INS.OPTI3.NAME9          "1.0x12.6";
INS.OPTI3.TYPE9         "SLIT"; # Element type


# used by OS status panel (shopanStatus)
INS.OPTI3.STUIFPOS         5;
```

```
# used by shortd to display slits (see also shiInsToDb.tcl)
INS.OPTI3.DRWCWP        "<alias>shortdUvbSlit";

# 5.0x11
INS.OPTI3.DRWXC1        257.6;
INS.OPTI3.DRWYC1        287.2;
INS.OPTI3.DRWWID1       28.4;
INS.OPTI3.DRWLEN1       62.4;
INS.OPTI3.DRWROT1       90;
INS.OPTI3.DRWCLR1       "blue";
INS.OPTI3.DRWLW1        0;

# 1.3x11
INS.OPTI3.DRWXC2        257.6;
INS.OPTI3.DRWYC2        287.2;
INS.OPTI3.DRWWID2       7.4;
INS.OPTI3.DRWLEN2       62.4;
INS.OPTI3.DRWROT2       90;
INS.OPTI3.DRWCLR2       "blue";
INS.OPTI3.DRWLW2        0;

# 0.8x11
INS.OPTI3.DRWXC3        257.6;
INS.OPTI3.DRWYC3        287.2;
INS.OPTI3.DRWWID3       4.5;
INS.OPTI3.DRWLEN3       62.4;
INS.OPTI3.DRWROT3       90;
INS.OPTI3.DRWCLR3       "blue";
INS.OPTI3.DRWLW3        0;

# Pin_row
INS.OPTI3.DRWXC4        257.6;
INS.OPTI3.DRWYC4        287.2;
INS.OPTI3.DRWWID4       0;
INS.OPTI3.DRWLEN4       0;
INS.OPTI3.DRWROT4       90;
INS.OPTI3.DRWCLR4       "blue";
INS.OPTI3.DRWLW4        0;

# Pin_0.5
INS.OPTI3.DRWXC5        257.6;
INS.OPTI3.DRWYC5        287.2;
INS.OPTI3.DRWWID5       2.8;
INS.OPTI3.DRWLEN5       2.8;
INS.OPTI3.DRWROT5       90;
INS.OPTI3.DRWCLR5       "blue";
INS.OPTI3.DRWLW5        0;

# 0.5x11
INS.OPTI3.DRWXC6        257.6;
INS.OPTI3.DRWYC6        287.2;
INS.OPTI3.DRWWID6       2.8;
INS.OPTI3.DRWLEN6       62.4;
INS.OPTI3.DRWROT6       90;
INS.OPTI3.DRWCLR6       "blue";
INS.OPTI3.DRWLW6        0;

# 1.0x11
INS.OPTI3.DRWXC7        257.6;
INS.OPTI3.DRWYC7        287.2;
INS.OPTI3.DRWWID7       5.7;
INS.OPTI3.DRWLEN7       62.4;
INS.OPTI3.DRWROT7       0;
INS.OPTI3.DRWCLR7       "blue";
INS.OPTI3.DRWLW7        0;

# 1.6x11
INS.OPTI3.DRWXC8        257.6;
INS.OPTI3.DRWYC8        287.2;
INS.OPTI3.DRWWID8       9.1;
INS.OPTI3.DRWLEN8       62.4;
INS.OPTI3.DRWROT8       90;
INS.OPTI3.DRWCLR8       "blue";
INS.OPTI3.DRWLW8        0;
```

```
# 1.0x12.6
INS.OPTI3.DRWXC9         257.6;
INS.OPTI3.DRWYC9         287.2;
INS.OPTI3.DRWWID9        5.7;
INS.OPTI3.DRWLEN9        71.4;
INS.OPTI3.DRWROT9        90;
INS.OPTI3.DRWCLR9        "blue";
INS.OPTI3.DRWLW9         0;



#
# Sample continuous position function, linear axis
#
INS.POS1.DEVNAME       "bfs"; # Name of the ICS device
INS.POS1.DEVDESC      "UVB camera focus"; # Description of the ICS device
INS.POS1.PREFIX   "INS.FOCU1"; # FITS prefix
INS.POS1.LCUID              1; # Id. of the LCU managing the device
#INS.POS1.INIALONE         F; # If T, initialise alone
INS.POS1.SWSIM              F; # If T, function is software simulated
INS.POS1.UNIT             "C";

#
# If a user unit conversion function is used, then the function
# "ic0devMotUsr2Enc" must be registered in the MCM OLDB (e.g.
# in shmcfgFOCUM.dbcfg).  ic0devMotUsr2Enc will call the function
# registered in INS.POSi.UNITFCT with the right parameters.
# INS.POS1.UNITFCT "ic0devMotUsr2Enc"; # User unit conversion function
#
INS.POS1.OFFSET         26025; # Reference position
INS.POS1.RAMP             73.5; # Ramp
INS.POS1.POSMIN           -20; # Min. focus position
INS.POS1.POSMAX            40; # Max. focus position
INS.POS1.TEMPRAMP           0; # Temperature slope
INS.POS1.TEMPREF           0; # Temperature reference
INS.POS1.TOLERANC         0.7;

# used by OS status panel (shopanStatus)
INS.POS1.STUIFPOS          5;


#
# Sample discrete positions function, linear axis
#
INS.OPTI4.DEVNAME      "vss"; # Name of the ICS device
INS.OPTI4.DEVDESC   "VIS slit"; # Description of the ICS device
INS.OPTI4.LCUID             1; # Id. of the LCU managing the device
#INS.OPTI4.INIALONE        F; # If T, initialise alone
INS.OPTI4.SWSIM             F; # If T, function is software simulated


INS.OPTI4.POSNUM           9;
INS.OPTI4.POSID1         "PS1";
INS.OPTI4.POSID2         "PS2";
INS.OPTI4.POSID3         "PS3";
INS.OPTI4.POSID4         "PS4";
INS.OPTI4.POSID5         "PS5";
INS.OPTI4.POSID6         "PS6";
INS.OPTI4.POSID7         "PS7";
INS.OPTI4.POSID8         "PS8";
INS.OPTI4.POSID9         "PS9";


INS.OPTI4.ID1            "PS1";
INS.OPTI4.NAME1          "5.0x11";
INS.OPTI4.TYPE1         "SLIT"; # Element type
INS.OPTI4.ID2            "PS2";
INS.OPTI4.NAME2          "1.2x11";
INS.OPTI4.TYPE2         "SLIT"; # Element type
INS.OPTI4.ID3            "PS3";
INS.OPTI4.NAME3          "0.7x11";
INS.OPTI4.TYPE3         "SLIT"; # Element type
INS.OPTI4.ID4            "PS4";
INS.OPTI4.NAME4          "Pin_row";
```

```
INS.OPTI4.TYPE4        "SLIT"; # Element type
INS.OPTI4.ID5           "PS5";
INS.OPTI4.NAME5         "Pin_0.5";
INS.OPTI4.TYPE5        "SLIT"; # Element type
INS.OPTI4.ID6           "PS6";
INS.OPTI4.NAME6         "0.4x11";
INS.OPTI4.TYPE6        "SLIT"; # Element type
INS.OPTI4.ID7           "PS7";
INS.OPTI4.NAME7         "0.9x11";
INS.OPTI4.TYPE7        "SLIT"; # Element type
INS.OPTI4.ID8           "PS8";
INS.OPTI4.NAME8         "1.5x11";
INS.OPTI4.TYPE8        "SLIT"; # Element type
INS.OPTI4.ID9           "PS9";
INS.OPTI4.NAME9         "1.0x12.6";
INS.OPTI4.TYPE9        "SLIT"; # Element type

# used by OS status panel (shopanStatus)
INS.OPTI4.STUIFPOS        5;

# used by shortd to display slits (see also shiInsToDb.tcl)
INS.OPTI4.DRWCWP        "<alias>shortdVisSlit";

# 5.0x11
INS.OPTI4.DRWXC1         257.6;
INS.OPTI4.DRWYC1         287.2;
INS.OPTI4.DRWWID1        28.4;
INS.OPTI4.DRWLEN1        62.4;
INS.OPTI4.DRWROT1        0;
INS.OPTI4.DRWCLR1        "yellow";
INS.OPTI4.DRWLW1         0;

# 1.2x11
INS.OPTI4.DRWXC2         257.6;
INS.OPTI4.DRWYC2         287.2;
INS.OPTI4.DRWWID2        6.8;
INS.OPTI4.DRWLEN2        62.4;
INS.OPTI4.DRWROT2        0;
INS.OPTI4.DRWCLR2        "blue";
INS.OPTI4.DRWLW2         0;

# 0.7x11
INS.OPTI4.DRWXC3         257.6;
INS.OPTI4.DRWYC3         287.2;
INS.OPTI4.DRWWID3        4.0;
INS.OPTI4.DRWLEN3        62.4;
INS.OPTI4.DRWROT3        0;
INS.OPTI4.DRWCLR3        "blue";
INS.OPTI4.DRWLW3         0;

# Pin_row
INS.OPTI4.DRWXC4         257.6;
INS.OPTI4.DRWYC4         287.2;
INS.OPTI4.DRWWID4        0;
INS.OPTI4.DRWLEN4        0;
INS.OPTI4.DRWROT4        0;
INS.OPTI4.DRWCLR4        "blue";
INS.OPTI4.DRWLW4         0;

# Pin_0.5
INS.OPTI4.DRWXC5         257.6;
INS.OPTI4.DRWYC5         287.2;
INS.OPTI4.DRWWID5        2.8;
INS.OPTI4.DRWLEN5        2.8;
INS.OPTI4.DRWROT5        0;
INS.OPTI4.DRWCLR5        "blue";
INS.OPTI4.DRWLW5         0;

# 0.4x11
INS.OPTI4.DRWXC6         257.6;
INS.OPTI4.DRWYC6         287.2;
INS.OPTI4.DRWWID6        2.3;
INS.OPTI4.DRWLEN6        62.4;
INS.OPTI4.DRWROT6        0;
INS.OPTI4.DRWCLR6        "blue";
```

```
INS.OPTI4.DRWLW6         0;

# 0.9x11
INS.OPTI4.DRWXC7         257.6;
INS.OPTI4.DRWYC7         287.2;
INS.OPTI4.DRWWID7        5.1;
INS.OPTI4.DRWLEN7        62.4;
INS.OPTI4.DRWROT7        0;
INS.OPTI4.DRWCLR7        "blue";
INS.OPTI4.DRWLW7         0;

# 1.5x11
INS.OPTI4.DRWXC8         257.6;
INS.OPTI4.DRWYC8         287.2;
INS.OPTI4.DRWWID8        8.5;
INS.OPTI4.DRWLEN8        62.4;
INS.OPTI4.DRWROT8        0;
INS.OPTI4.DRWCLR8        "blue";
INS.OPTI4.DRWLW8         0;

# 1.0x12.6
INS.OPTI4.DRWXC9         257.6;
INS.OPTI4.DRWYC9         287.2;
INS.OPTI4.DRWWID9        5.7;
INS.OPTI4.DRWLEN9        71.4;
INS.OPTI4.DRWROT9        0;
INS.OPTI4.DRWCLR9        "blue";
INS.OPTI4.DRWLW9         0;



#
# Sample continuous position function, linear axis
#
INS.POS2.DEVNAME       "vfs"; # Name of the ICS device
INS.POS2.DEVDESC      "VIS camera focus"; # Description of the ICS device
INS.POS2.PREFIX   "INS.FOCU2"; # FITS prefix
INS.POS2.LCUID              1; # Id. of the LCU managing the device
#INS.POS2.INIALONE         F; # If T, initialise alone
INS.POS2.SWSIM              F; # If T, function is software simulated
INS.POS2.UNIT             "C";

#
# If a user unit conversion function is used, then the function
# "ic0devMotUsr2Enc" must be registered in the MCM OLDB (e.g.
# in shmcfgFOCUM.dbcfg).  ic0devMotUsr2Enc will call the function
# registered in INS.POSi.UNITFCT with the right parameters.
# INS.POS2.UNITFCT "shidevFocuUsr2Enc"; # User unit conversion function
#
INS.POS2.OFFSET         11750; # Reference position
INS.POS2.RAMP             0.1; # Ramp
INS.POS2.POSMIN           -20; # Min. focus position
INS.POS2.POSMAX            40; # Max. focus position
INS.POS2.TEMPRAMP           0; # Temperature slope
INS.POS2.TEMPREF            0; # Temperature reference
INS.POS2.TOLERANC        20.0;

# used by OS status panel (shopanStatus)
INS.POS2.STUIFPOS          5;


#
# Sample discrete positions function, linear axis
#
INS.OPTI5.DEVNAME      "nss"; # Name of the ICS device
INS.OPTI5.DEVDESC "NIR slit wheel"; # Description of the ICS device
INS.OPTI5.LCUID             1; # Id. of the LCU managing the device
#INS.OPTI5.INIALONE         F; # If T, initialise alone
INS.OPTI5.SWSIM             F; # If T, function is software simulated

INS.OPTI5.POSNUM          12;
INS.OPTI5.POSID1        "PS1";
INS.OPTI5.POSID2        "PS2";
INS.OPTI5.POSID3        "PS3";
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INS.OPTI5.POSID4        "PS4";
INS.OPTI5.POSID5        "PS5";
INS.OPTI5.POSID6        "PS6";
INS.OPTI5.POSID7        "PS7";
INS.OPTI5.POSID8        "PS8";
INS.OPTI5.POSID9        "PS9";
INS.OPTI5.POSID10       "PS10";
INS.OPTI5.POSID11       "PS11";
INS.OPTI5.POSID12       "PS12";

INS.OPTI5.ID1           "PS1";
INS.OPTI5.NAME1         "Pin_0.5";
INS.OPTI5.TYPE1        "SLIT"; # Element type
INS.OPTI5.ID2           "PS2";
INS.OPTI5.NAME2         "5.0x11";
INS.OPTI5.TYPE2        "SLIT"; # Element type
INS.OPTI5.ID3           "PS3";
INS.OPTI5.NAME3         "0.9x11";
INS.OPTI5.TYPE3        "SLIT"; # Element type
INS.OPTI5.ID4           "PS4";
INS.OPTI5.NAME4         "1.0x12.6";
INS.OPTI5.TYPE4        "SLIT"; # Element type
INS.OPTI5.ID5           "PS5";
INS.OPTI5.NAME5         "1.2x11";
INS.OPTI5.TYPE5        "SLIT"; # Element type
INS.OPTI5.ID6           "PS6";
INS.OPTI5.NAME6         "Tilt_slt";
INS.OPTI5.TYPE6        "SLIT"; # Element type
INS.OPTI5.ID7           "PS7";
INS.OPTI5.NAME7         "1.5x11";
INS.OPTI5.TYPE7        "SLIT"; # Element type
INS.OPTI5.ID8           "PS8";
INS.OPTI5.NAME8         "Blind";
INS.OPTI5.TYPE8        "SLIT"; # Element type
INS.OPTI5.ID9           "PS9";
INS.OPTI5.NAME9         "Pin_0.4";
INS.OPTI5.TYPE9        "SLIT"; # Element type
INS.OPTI5.ID10           "PS10";
INS.OPTI5.NAME10        "0.4x11";
INS.OPTI5.TYPE10       "SLIT"; # Element type
INS.OPTI5.ID11          "PS11";
INS.OPTI5.NAME11        "Pin_row";
INS.OPTI5.TYPE11       "SLIT"; # Element type
INS.OPTI5.ID12          "PS12";
INS.OPTI5.NAME12        "0.6x11";
INS.OPTI5.TYPE12       "SLIT"; # Element type

# used by OS status panel (shopanStatus)
INS.OPTI5.STUIFPOS        5;

# used by shortd to display slits (see also shiInsToDb.tcl)
INS.OPTI5.DRWCWP        "<alias>shortdNirSlit";

# Pin_0.5
INS.OPTI5.DRWXC1         257.6;
INS.OPTI5.DRWYC1         287.2
INS.OPTI5.DRWWID1        2.8;
INS.OPTI5.DRWLEN1        2.8;
INS.OPTI5.DRWROT1        0;
INS.OPTI5.DRWCLR1        "red";
INS.OPTI5.DRWLW1         0;

# 5.0x11
INS.OPTI5.DRWXC2         257.6;
INS.OPTI5.DRWYC2         287.2;
INS.OPTI5.DRWWID2        28.4;
INS.OPTI5.DRWLEN2        62.5;
INS.OPTI5.DRWROT2        0;
INS.OPTI5.DRWCLR2        "red";
INS.OPTI5.DRWLW2         0;

# 0.9x11
INS.OPTI5.DRWXC3         257.6;
INS.OPTI5.DRWYC3         287.2;
INS.OPTI5.DRWWID3        5.1;
```

```
INS.OPTI5.DRWLEN3        62.5;
INS.OPTI5.DRWROT3        0;
INS.OPTI5.DRWCLR3        "red";
INS.OPTI5.DRWLW3         0;

# 1.0x12.6
INS.OPTI5.DRWXC4         257.6;
INS.OPTI5.DRWYC4         287.2;
INS.OPTI5.DRWWID4        5.7;
INS.OPTI5.DRWLEN4        71.6;
INS.OPTI5.DRWROT4        0;
INS.OPTI5.DRWCLR4        "red";
INS.OPTI5.DRWLW4         0;

# 1.2x11
INS.OPTI5.DRWXC5         257.6;
INS.OPTI5.DRWYC5         287.2;
INS.OPTI5.DRWWID5        6.8;
INS.OPTI5.DRWLEN5        62.5;
INS.OPTI5.DRWROT5        0;
INS.OPTI5.DRWCLR5        "red";
INS.OPTI5.DRWLW5         0;

# Tilt_slt
INS.OPTI5.DRWXC6         257.6;
INS.OPTI5.DRWYC6         287.2;
INS.OPTI5.DRWWID6        0;
INS.OPTI5.DRWLEN6        0;
INS.OPTI5.DRWROT6        0;
INS.OPTI5.DRWCLR6        "red";
INS.OPTI5.DRWLW6         0;

# 1.5x11
INS.OPTI5.DRWXC7         257.6;
INS.OPTI5.DRWYC7         287.2;
INS.OPTI5.DRWWID7        8.5;
INS.OPTI5.DRWLEN7        62.5;
INS.OPTI5.DRWROT7        0;
INS.OPTI5.DRWCLR7        "red";
INS.OPTI5.DRWLW7         0;

# Blind
INS.OPTI5.DRWXC8         257.6;
INS.OPTI5.DRWYC8         287.2;
INS.OPTI5.DRWWID8        0;
INS.OPTI5.DRWLEN8        0;
INS.OPTI5.DRWROT8        0;
INS.OPTI5.DRWCLR8        "red";
INS.OPTI5.DRWLW8         0;

# Pin_0.4
INS.OPTI5.DRWXC9         257.6;
INS.OPTI5.DRWYC9         287.2;
INS.OPTI5.DRWWID9        2.3;
INS.OPTI5.DRWLEN9        2.3;
INS.OPTI5.DRWROT9        0;
INS.OPTI5.DRWCLR9        "red";
INS.OPTI5.DRWLW9         0;

# 0.4x11
INS.OPTI5.DRWXC10         257.6;
INS.OPTI5.DRWYC10         287.2;
INS.OPTI5.DRWWID10        2.3;
INS.OPTI5.DRWLEN10        62.5;
INS.OPTI5.DRWROT10        0;
INS.OPTI5.DRWCLR10        "red";
INS.OPTI5.DRWLW10         0;

# Pin_row
INS.OPTI5.DRWXC11         257.6;
INS.OPTI5.DRWYC11         287.2;
INS.OPTI5.DRWWID11        0;
INS.OPTI5.DRWLEN11        0;
INS.OPTI5.DRWROT11        0;
INS.OPTI5.DRWCLR11        "red";
```

```
INS.OPTI5.DRWLW11         0;

# 0.6x11
INS.OPTI5.DRWXC12         257.6;
INS.OPTI5.DRWYC12         287.2;
INS.OPTI5.DRWWID12        3.4;
INS.OPTI5.DRWLEN12        62.5;
INS.OPTI5.DRWROT12        0;
INS.OPTI5.DRWCLR12        "red";
INS.OPTI5.DRWLW12         0;



INS.SENSOR5.DEVNAME       "bal";                  # Name of the ICS device.
INS.SENSOR5.DEVDESC       "NIR Pressure Mon.";      # Description of the ICS device.
INS.SENSOR5.DEVTYPE       "shibalBAL";            # ICS device type.
INS.SENSOR5.PROCNAME      "shibalServer";          # Name of the LCU server process
INS.SENSOR5.LCUID         2;                       # Id. of the LCU managing the device.
INS.SENSOR5.SWSIM         F                        # If T, function is software simulated.
INS.SENSOR5.PORT          "/iser5"                # Hardware device.
INS.SENSOR5.NUM           1;                       # Number of managed sensor values.
INS.SENSOR5.UIFSPECIAL    T;                       # Is a special device
INS.SENSOR5.UIFCLASS     "shipanPfeifferSens";

INS.SENSOR5.NAME1         "NPM";                   # Sensor name.
INS.SENSOR5.DESC1         "NIR cryo. P";        # Sensor description.
INS.SENSOR5.HEADER1       T;                       # Report sensor in the header.
INS.SENSOR5.FITS1         "INS.SENS60.VAL";        # Sensor FITS keyword.
INS.SENSOR5.SENADDR1      6;                       # Sensor hardware address.
INS.SENSOR5.LOG1          T;                       # If T, then regularly log the sensor value.
INS.SENSOR5.SENUNIT1      "mbar";

# used by OS status panel (shopanStatus)
INS.SENSOR5.STUIFPOS1        8;
INS.SENSOR5.UIFLEDMIN1  0;
INS.SENSOR5.UIFLEDMAX1  0.99;
INS.SENSOR5.UIFLEDCWP1  "<alias>balAlarm.alarm";

# used to set alarm ranges (see shiInsToDb.tcl)
INS.SENSOR5.ALRMCWP1       "<alias>balAlarm";
INS.SENSOR5.ALRMMIN1          0.000000001;
INS.SENSOR5.ALRMMAX1          0.00001;

#
# NIR cryostat monitoring
#
INS.SENSOR6.DEVNAME       "cryo";                  # Name of the ICS device.
INS.SENSOR6.DEVDESC       "NIR Cryostat Mon.";     # Description of the ICS device.
INS.SENSOR6.DEVTYPE       "LAKESHORE";             # ICS device type.
INS.SENSOR6.MODEL         "218";                   # Device model
INS.SENSOR6.LCUID         2;                       # Id. of the LCU managing the device.
INS.SENSOR6.SWSIM         F;                       # If T, function is software simulated.
INS.SENSOR6.PORT          "/iser0";                # Hardware device.
INS.SENSOR6.NUM           7;                       # Number of managed sensor values.

INS.SENSOR6.NAME1         "OBCT";                  # Sensor name.
INS.SENSOR6.DESC1         "OB Cover Tel.";    # Sensor description.
INS.SENSOR6.HEADER1       T;                       # Report sensor in the header.
INS.SENSOR6.FITS1         "INS.TEMP80.VAL";        # Sensor FITS keyword.
INS.SENSOR6.SENADDR1      1;                       # Sensor hardware address.
INS.SENSOR6.LOG1          T;                       # If T, then regularly log the sensor value.
INS.SENSOR6.SENUNIT1      "K";

# used by OS status panel (shopanStatus)
INS.SENSOR6.STUIFPOS1   8;
INS.SENSOR6.UIFLEDMIN1  0;
INS.SENSOR6.UIFLEDMAX1  0.99;
INS.SENSOR6.UIFLEDCWP1  "<alias>obctAlarm.alarm";

# used to set alarm ranges (see shiInsToDb.tcl)
INS.SENSOR6.ALRMCWP1       "<alias>obctAlarm";
INS.SENSOR6.ALRMMIN1        103.0;
INS.SENSOR6.ALRMMAX1        107.0;
```

```
INS.SENSOR6.NAME2         "OBCB";                  # Sensor name.
INS.SENSOR6.DESC2         "OB Cover Tank";    # Sensor description.
INS.SENSOR6.HEADER2       T;                       # Report sensor in the header.
INS.SENSOR6.FITS2         "INS.TEMP81.VAL";        # Sensor FITS keyword.
INS.SENSOR6.SENADDR2      2;                       # Sensor hardware address.
INS.SENSOR6.LOG2          T;                       # If T, then regularly log the sensor value.
INS.SENSOR6.SENUNIT2      "K";

# used by OS status panel (shopanStatus)
INS.SENSOR6.STUIFPOS2   8;
INS.SENSOR6.UIFLEDMIN2  0;
INS.SENSOR6.UIFLEDMAX2  0.99;
INS.SENSOR6.UIFLEDCWP2  "<alias>obcbAlarm.alarm";

# used to set alarm ranges (see shiInsToDb.tcl)
INS.SENSOR6.ALRMCWP2       "<alias>obcbAlarm";
INS.SENSOR6.ALRMMIN2        103.0;
INS.SENSOR6.ALRMMAX2        107.0;


INS.SENSOR6.NAME3         "OBPR";                  # Sensor name.
INS.SENSOR6.DESC3         "OB Prism1";             # Sensor description.
INS.SENSOR6.HEADER3       T;                       # Report sensor in the header.
INS.SENSOR6.FITS3         "INS.TEMP82.VAL";        # Sensor FITS keyword.
INS.SENSOR6.SENADDR3      3;                       # Sensor hardware address.
INS.SENSOR6.LOG3          T;                       # If T, then regularly log the sensor value.
INS.SENSOR6.SENUNIT3      "K";

# used by OS status panel (shopanStatus)
INS.SENSOR6.STUIFPOS3   8;
INS.SENSOR6.UIFLEDMIN3  0;
INS.SENSOR6.UIFLEDMAX3  0.99;
INS.SENSOR6.UIFLEDCWP3  "<alias>obprAlarm.alarm";

# used to set alarm ranges (see shiInsToDb.tcl)
INS.SENSOR6.ALRMCWP3       "<alias>obprAlarm";
INS.SENSOR6.ALRMMIN3        103.0;
INS.SENSOR6.ALRMMAX3        107.0;

INS.SENSOR6.NAME4         "OBCL";                  # Sensor name.
INS.SENSOR6.DESC4         "OB Corrector Lens";     # Sensor description.
INS.SENSOR6.HEADER4       T;                       # Report sensor in the header.
INS.SENSOR6.FITS4         "INS.TEMP83.VAL";        # Sensor FITS keyword.
INS.SENSOR6.SENADDR4      4;                       # Sensor hardware address.
INS.SENSOR6.LOG4          T;                       # If T, then regularly log the sensor value.
INS.SENSOR6.SENUNIT4      "K";

# used by OS status panel (shopanStatus)
INS.SENSOR6.STUIFPOS4   8;
INS.SENSOR6.UIFLEDMIN4  0;
INS.SENSOR6.UIFLEDMAX4  0.99;
INS.SENSOR6.UIFLEDCWP4  "<alias>obclAlarm.alarm";

# used to set alarm ranges (see shiInsToDb.tcl)
INS.SENSOR6.ALRMCWP4       "<alias>obclAlarm";
INS.SENSOR6.ALRMMIN4        103.0;
INS.SENSOR6.ALRMMAX4        107.0;

INS.SENSOR6.NAME5         "CP";                    # Sensor name.
INS.SENSOR6.DESC5         "Cryo. Cold Plate";   # Sensor description.
INS.SENSOR6.HEADER5       T;                       # Report sensor in the header.
INS.SENSOR6.FITS5         "INS.TEMP84.VAL";        # Sensor FITS keyword.
INS.SENSOR6.SENADDR5      5;                       # Sensor hardware address.
INS.SENSOR6.LOG5          T;                       # If T, then regularly log the sensor value.
INS.SENSOR6.SENUNIT5      "K";

# used by OS status panel (shopanStatus)
INS.SENSOR6.STUIFPOS5   8;
INS.SENSOR6.UIFLEDMIN5  0;
INS.SENSOR6.UIFLEDMAX5  0.99;
INS.SENSOR6.UIFLEDCWP5  "<alias>cpAlarm.alarm";

# used to set alarm ranges (see shiInsToDb.tcl)
INS.SENSOR6.ALRMCWP5       "<alias>cpAlarm";
INS.SENSOR6.ALRMMIN5        0.;
```

```
INS.SENSOR6.ALRMMAX5        95;


INS.SENSOR6.NAME6         "RS";                    # Sensor name.
INS.SENSOR6.DESC6         "Cryo. rad. shield"      # Sensor description.
INS.SENSOR6.HEADER6       T;                       # Report sensor in the header.
INS.SENSOR6.FITS6         "INS.TEMP85.VAL";        # Sensor FITS keyword.
INS.SENSOR6.SENADDR6      6;                       # Sensor hardware address.
INS.SENSOR6.LOG6          T;                       # If T, then regularly log the sensor value.
INS.SENSOR6.SENUNIT6      "K";

# used by OS status panel (shopanStatus)
INS.SENSOR6.STUIFPOS6   8;
INS.SENSOR6.UIFLEDMIN6  0;
INS.SENSOR6.UIFLEDMAX6  0.99;
INS.SENSOR6.UIFLEDCWP6  "<alias>rsAlarm.alarm";

# used to set alarm ranges (see shiInsToDb.tcl)
INS.SENSOR6.ALRMCWP6       "<alias>rsAlarm";
INS.SENSOR6.ALRMMIN6        0.;
INS.SENSOR6.ALRMMAX6        110.;


INS.SENSOR6.NAME7         "DCB";                   # Sensor name.
INS.SENSOR6.DESC7         "CCD Copper bar";   # Sensor description.
INS.SENSOR6.HEADER7       T;                       # Report sensor in the header.
INS.SENSOR6.FITS7         "INS.TEMP86.VAL";        # Sensor FITS keyword.
INS.SENSOR6.SENADDR7      7;                       # Sensor hardware address.
INS.SENSOR6.LOG7          T;                       # If T, then regularly log the sensor value.
INS.SENSOR6.SENUNIT7      "K";

# used by OS status panel (shopanStatus)
INS.SENSOR6.STUIFPOS7   8;
INS.SENSOR6.UIFLEDMIN7  0;
INS.SENSOR6.UIFLEDMAX7  0.99;
INS.SENSOR6.UIFLEDCWP7  "<alias>dcbAlarm.alarm";

# used to set alarm ranges (see shiInsToDb.tcl)
INS.SENSOR6.ALRMCWP7       "<alias>dcbAlarm";
INS.SENSOR6.ALRMMIN7        0.;
INS.SENSOR6.ALRMMAX7        83.;

# NOT CONNECTED
#INS.SENSOR6.NAME8         "OBGR";                   # Sensor name.
#INS.SENSOR6.DESC8         "OB Grating";             # Sensor description.
#INS.SENSOR6.HEADER8       T;                       # Report sensor in the header.
#INS.SENSOR6.FITS8         "INS.TEMP87.VAL";        # Sensor FITS keyword.
#INS.SENSOR6.SENADDR8      8;                       # Sensor hardware address.
#INS.SENSOR6.LOG8          T;                       # If T, then regularly log the sensor value.
#INS.SENSOR6.SENUNIT8      "K";

# used by OS status panel (shopanStatus)
#INS.SENSOR6.STUIFPOS8   8;
#INS.SENSOR6.UIFLEDMIN8  0;
#INS.SENSOR6.UIFLEDMAX8  0.99;
#INS.SENSOR6.UIFLEDCWP8  "<alias>obgrAlarm.alarm";

# used to set alarm ranges (see shiInsToDb.tcl)
#INS.SENSOR6.ALRMCWP8       "<alias>obgrAlarm";
#INS.SENSOR6.ALRMMIN8        104.9;
#INS.SENSOR6.ALRMMAX8        105.1;


# used to configure Ready For Observation flag
# see also file shiInsToDb.tcl and Xshooter User Manual

INS.RFO.NUM               3;

INS.RFO.ALRMCWP1          "<alias>rfo1Alarm";
INS.RFO.ALRMMIN1          1;
INS.RFO.ALRMMAX1          105;

INS.RFO.ALRMCWP2          "<alias>rfo2Alarm";
INS.RFO.ALRMMIN2          1;
INS.RFO.ALRMMAX2          105;
```

```
INS.RFO.ALRMCWP3            "<alias>rfo3Alarm";
INS.RFO.ALRMMIN3            0.1;
INS.RFO.ALRMMAX3            1;



#
# NIR head temperature sensor
#
INS.SENSOR7.DEVNAME       "lake";                  # Name of the ICS device.
INS.SENSOR7.DEVDESC       "NIR Head Temp.";        # Description of the ICS device.
INS.SENSOR7.DEVTYPE       "LAKESHORE";             # ICS device type.
INS.SENSOR7.MODEL         "340";                   # Device model
INS.SENSOR7.LCUID         2;                       # Id. of the LCU managing the device.
INS.SENSOR7.SWSIM         F;                       # If T, function is software simulated.
INS.SENSOR7.PORT          "/iser1";                # Hardware device.
INS.SENSOR7.NUM           12;                       # Number of managed sensor values.

INS.SENSOR7.NAME1         "NHT";                   # Sensor name.
INS.SENSOR7.DESC1         "NIR Head temp.";        # Sensor description.
INS.SENSOR7.HEADER1       T;                       # Report sensor in the header.
INS.SENSOR7.FITS1         "INS.TEMP90.VAL";        # Sensor FITS keyword.
INS.SENSOR7.SENADDR1      1;                       # Sensor hardware address.
INS.SENSOR7.LOG1          T;                       # If T, then regularly log the sensor value.
INS.SENSOR7.SENUNIT1      "K";


# used by OS status panel (shopanStatus)
INS.SENSOR7.STUIFPOS1   8;
INS.SENSOR7.UIFLEDMIN1  0;
INS.SENSOR7.UIFLEDMAX1  0.99;
INS.SENSOR7.UIFLEDCWP1  "<alias>lakeAlarm.alarm";

# used to set alarm ranges (see shiInsToDb.tcl)
INS.SENSOR7.ALRMCWP1       "<alias>lakeAlarm";
INS.SENSOR7.ALRMMIN1        0.;
INS.SENSOR7.ALRMMAX1        82.;


INS.SENSOR7.NAME2        "SetP1"; # Sensor value name
INS.SENSOR7.DESC2  "Set Point 1"; # Sensoar value description
INS.SENSOR7.HEADER2           F; # If T, report sensor value in image header
INS.SENSOR7.FITS2 "INS.SENS72.VAL"; # Sensor value FITS keyword
INS.SENSOR7.SENUNIT2       "K"; # Sensor value unit
INS.SENSOR7.SENADDR2         2; # Sensor value hardware address
INS.SENSOR7.LOG2             F; # If T, then regularly log the sensor value.


INS.SENSOR7.NAME3        "P1"; # Sensor value name
INS.SENSOR7.DESC3  "PID 1 P value"; # Sensoar value description
INS.SENSOR7.HEADER3           F; # If T, report sensor value in image header
INS.SENSOR7.FITS3 "INS.SENS73.VAL"; # Sensor value FITS keyword
INS.SENSOR7.SENUNIT3         ""; # Sensor value unit
INS.SENSOR7.SENADDR3         3; # Sensor value hardware address
INS.SENSOR7.LOG3             F; # If T, then regularly log the sensor value.

INS.SENSOR7.NAME4        "I1"; # Sensor value name
INS.SENSOR7.DESC4  "PID 1 I value"; # Sensoar value description
INS.SENSOR7.HEADER4           F; # If T, report sensor value in image header
INS.SENSOR7.FITS4 "INS.SENS74.VAL"; # Sensor value FITS keyword
INS.SENSOR7.SENUNIT4         ""; # Sensor value unit
INS.SENSOR7.SENADDR4         4; # Sensor value hardware address
INS.SENSOR7.LOG4             F; # If T, then regularly log the sensor value.

INS.SENSOR7.NAME5        "D1"; # Sensor value name
INS.SENSOR7.DESC5  "PID 1 D value"; # Sensoar value description
INS.SENSOR7.HEADER5           F; # If T, report sensor value in image header
INS.SENSOR7.FITS5 "INS.SENS75.VAL"; # Sensor value FITS keyword
INS.SENSOR7.SENUNIT5         ""; # Sensor value unit
INS.SENSOR7.SENADDR5         5; # Sensor value hardware address
INS.SENSOR7.LOG5             F; # If T, then regularly log the sensor value.

INS.SENSOR7.NAME6        "TempB"; # Sensor value name
INS.SENSOR7.DESC6  "Channel B Temp"; # Sensoar value description
```

```
INS.SENSOR7.HEADER6           F; # If T, report sensor value in image header
INS.SENSOR7.FITS6 "INS.SENS76.VAL"; # Sensor value FITS keyword
INS.SENSOR7.SENUNIT6        "K"; # Sensor value unit
INS.SENSOR7.SENADDR6         6; # Sensor value hardware address
INS.SENSOR7.LOG6             F; # If T, then regularly log the sensor value.
INS.SENSOR7.SKIP6            F; # If T, function is software simulated

INS.SENSOR7.NAME7        "SetP2"; # Sensor value name
INS.SENSOR7.DESC7  "Set Point 2"; # Sensoar value description
INS.SENSOR7.HEADER7           F; # If T, report sensor value in image header
INS.SENSOR7.FITS7 "INS.SENS77.VAL"; # Sensor value FITS keyword
INS.SENSOR7.SENUNIT7       "K"; # Sensor value unit
INS.SENSOR7.SENADDR7         7; # Sensor value hardware address
INS.SENSOR7.LOG7             F; # If T, then regularly log the sensor value.


INS.SENSOR7.NAME8        "P2"; # Sensor value name
INS.SENSOR7.DESC8  "PID 2 P value"; # Sensoar value description
INS.SENSOR7.HEADER8           F; # If T, report sensor value in image header
INS.SENSOR7.FITS8 "INS.SENS78.VAL"; # Sensor value FITS keyword
INS.SENSOR7.SENUNIT8         ""; # Sensor value unit
INS.SENSOR7.SENADDR8         8; # Sensor value hardware address
INS.SENSOR7.LOG8             F; # If T, then regularly log the sensor value.

INS.SENSOR7.NAME9        "I2"; # Sensor value name
INS.SENSOR7.DESC9  "PID 2 I value"; # Sensoar value description
INS.SENSOR7.HEADER9           F; # If T, report sensor value in image header
INS.SENSOR7.FITS9 "INS.SENS79.VAL"; # Sensor value FITS keyword
INS.SENSOR7.SENUNIT9         ""; # Sensor value unit
INS.SENSOR7.SENADDR9         9; # Sensor value hardware address
INS.SENSOR7.LOG9             F; # If T, then regularly log the sensor value.

INS.SENSOR7.NAME10        "D2"; # Sensor value name
INS.SENSOR7.DESC10  "PID 2 D value"; # Sensoar value description
INS.SENSOR7.HEADER10           F; # If T, report sensor value in image header
INS.SENSOR7.FITS10 "INS.SENS80.VAL"; # Sensor value FITS keyword
INS.SENSOR7.SENUNIT10         ""; # Sensor value unit
INS.SENSOR7.SENADDR10        10; # Sensor value hardware address
INS.SENSOR7.LOG10             F; # If T, then regularly log the sensor value.

INS.SENSOR7.NAME11        "RANGE"; # Sensor value name
INS.SENSOR7.DESC11  "Heater Range"; # Sensoar value description
INS.SENSOR7.HEADER11           T; # If T, report sensor value in image header
INS.SENSOR7.FITS11 "INS.SENS81.VAL"; # Sensor value FITS keyword
INS.SENSOR7.SENUNIT11         ""; # Sensor value unit
INS.SENSOR7.SENADDR11        11; # Sensor value hardware address
INS.SENSOR7.LOG11             T; # If T, then regularly log the sensor value.

INS.SENSOR7.NAME12        "HEATR"; # Sensor value name
INS.SENSOR7.DESC12  "Heater output"; # Sensoar value description
INS.SENSOR7.HEADER12           T; # If T, report sensor value in image header
INS.SENSOR7.FITS12 "INS.SENS82.VAL"; # Sensor value FITS keyword
INS.SENSOR7.SENUNIT12         "%"; # Sensor value unit
INS.SENSOR7.SENADDR12        12; # Sensor value hardware address
INS.SENSOR7.LOG12             T; # If T, then regularly log the sensor value.



#
# 2.2 ICS Assemblies
#
# SENSORS consists of some sensor devices
INS.ASSEMBLY1 "INS.SENSORS"; # Assembly FITS name
INS.ASSEMBLY1.KEY1 ""
INS.ASSEMBLY1.VAL1 "INS.SENSOR1 INS.SENSOR2 INS.SENSOR3 INS.SENSOR4 INS.SENSOR5 INS.SENSOR6
INS.SENSOR7"
# INS.MODE
# accept any value of INS.MODE and do not forward this key to the LCUs
INS.ASSEMBLY2 "INS.MODE"; # Assembly FITS name
INS.ASSEMBLY2.KEY1 "*"
INS.ASSEMBLY2.VAL1 ""
# INS.PATH used for EXPSTRT/EXPEND -path
# Paths must be consistant with OS configuration
INS.ASSEMBLY3 "INS.PATH"; # Assembly FITS name
```

```
INS.ASSEMBLY3.KEY1 "SLITSPEC"
INS.ASSEMBLY3.VAL1 ""
INS.ASSEMBLY3.KEY2 "IFUSPEC"
INS.ASSEMBLY3.VAL2 ""
INS.ASSEMBLY3.KEY3 "IMAG"
INS.ASSEMBLY3.VAL3 ""
INS.ASSEMBLY3.KEY4 "CALIB"
INS.ASSEMBLY3.VAL4 ""
# INS.LAMP OFF is executed in one step only:
INS.ASSEMBLY4 "INS.LAMP"; # Assembly FITS name
#INS.ASSEMBLY4.HEADER   F; # Last setup value goes in the FITS header
INS.ASSEMBLY4.KEY1 "OFF"
INS.ASSEMBLY4.VAL1 "INS.LAMP1.ST F INS.LAMP2.ST F INS.LAMP3.ST F INS.LAMP4.ST F INS.LAMP5.ST F
INS.LAMP6.ST F"

# ADCB
#
INS.ASSEMBLY5 "INS.ADCB"
INS.ASSEMBLY5.KEY1 "OFF"
INS.ASSEMBLY5.VAL1 "INS.ADC1.MODE OFF INS.ADC2.MODE OFF"
INS.ASSEMBLY5.KEY2 "AUTO"
INS.ASSEMBLY5.VAL2 "INS.ADC1.MODE AUTO INS.ADC2.MODE AUTO"

# ADCV
#
INS.ASSEMBLY6 "INS.ADCV"
INS.ASSEMBLY6.KEY1 "OFF"
INS.ASSEMBLY6.VAL1 "INS.ADC3.MODE OFF INS.ADC4.MODE OFF"
INS.ASSEMBLY6.KEY2 "AUTO"
INS.ASSEMBLY6.VAL2 "INS.ADC3.MODE AUTO INS.ADC4.MODE AUTO"


#
# 2.3.1 OS status panel GUI configuration
#
OCS.UIF.MAINLABEL "X-shooter"
OCS.UIF.NFRAMES 9
OCS.UIF.LABEL1 ""
OCS.UIF.LABEL2 "Calibration Unit"
OCS.UIF.LABEL3 "Preslit Unit"
OCS.UIF.LABEL4 "Detectors"
OCS.UIF.LABEL5 "UVB & VIS Spectrographs"
OCS.UIF.LABEL6 "General Housekeeping"
OCS.UIF.LABEL7 "UVB & VIS Monitoring"
OCS.UIF.LABEL8 "NIR Monitoring"
OCS.UIF.LABEL9 "NIR Housekeeping"

#
# 2.3.2 ICS stand-alone GUI configuration
#

INS.UIF.NBOOKS   6

INS.UIF1.TABS    3
INS.UIF2.TABS    1
INS.UIF3.TABS    1
INS.UIF4.TABS    1
INS.UIF5.TABS    4
INS.UIF6.TABS    3


INS.UIF1.LABEL1  "Spectrogr. FE - Motors"
INS.UIF1.LABEL2  "Spectrogr. FE - Lamps"
INS.UIF1.LABEL3  "Spectrogr. FE - AFCS"

INS.UIF2.LABEL1  "UVB Spectrograph"

INS.UIF3.LABEL1  "VIS Spectrograph"

INS.UIF4.LABEL1  "NIR Spectrograph"

INS.UIF5.LABEL1  "TMS"
INS.UIF5.LABEL2  "DIS1"
INS.UIF5.LABEL3  "DIS2"
INS.UIF5.LABEL4  "CCC1"
```

```
# removed during ESO integration
# INS.UIF5.LABEL5  "CCC2"

INS.UIF6.LABEL1 "CRYO"
INS.UIF6.LABEL2 "LAKE"
INS.UIF6.LABEL3 "Pfeiffer"


INS.LAMP1.UIFNB    1
INS.LAMP1.UIFTB    2
INS.LAMP2.UIFNB    1
INS.LAMP2.UIFTB    2
INS.LAMP3.UIFNB    1
INS.LAMP3.UIFTB    2
INS.LAMP4.UIFNB    1
INS.LAMP4.UIFTB    2
INS.LAMP5.UIFNB    1
INS.LAMP5.UIFTB    2
INS.LAMP6.UIFNB    1
INS.LAMP6.UIFTB    2

INS.OPTI1.UIFNB    1
INS.OPTI1.UIFTB    1
INS.MIRR1.UIFNB    1
INS.MIRR1.UIFTB    1
INS.OPTI2.UIFNB    1
INS.OPTI2.UIFTB    1
INS.FILT1.UIFNB    1
INS.FILT1.UIFTB    1
INS.ADC1.UIFNB     1
INS.ADC1.UIFTB     1
INS.ADC2.UIFNB     1
INS.ADC2.UIFTB     1
INS.ADC3.UIFNB     1
INS.ADC3.UIFTB     1
INS.ADC4.UIFNB     1
INS.ADC4.UIFTB     1
INS.OPTI3.UIFNB    2
INS.OPTI3.UIFTB    1
INS.POS1.UIFNB     2
INS.POS1.UIFTB     1
INS.OPTI4.UIFNB    3
INS.OPTI4.UIFTB    1
INS.POS2.UIFNB     3
INS.POS2.UIFTB     1
INS.OPTI5.UIFNB    4
INS.OPTI5.UIFTB    1
INS.FCTILT1.UIFNB  1
INS.FCTILT1.UIFTB  3
INS.FCTILT2.UIFNB  1
INS.FCTILT2.UIFTB  3
INS.FCTILT3.UIFNB  1
INS.FCTILT3.UIFTB  3


INS.SENSOR1.UIFNB  5
INS.SENSOR1.UIFTB  1
INS.SENSOR2.UIFNB  5
INS.SENSOR2.UIFTB  2
INS.SENSOR2.UIFWID 6
INS.SENSOR3.UIFNB  5
INS.SENSOR3.UIFTB  3
INS.SENSOR4.UIFNB  5
INS.SENSOR4.UIFTB  4

# removed during ESO integration
# INS.SENSOR5.UIFNB  5
# INS.SENSOR5.UIFTB  5

INS.SENSOR5.UIFNB  6
INS.SENSOR5.UIFTB  3
INS.SENSOR6.UIFNB  6
INS.SENSOR6.UIFTB  1
INS.SENSOR7.UIFNB  6
```

```
INS.SENSOR7.UIFTB  2

#
# 2.4 ICS OLDB "scan" feature
#
# To be commented out if LCU 1 is available, otherwise lot of errors on logMonitor
INS.SCAN.PERIOD  5
INS.SCAN1.DBFROM "<alias>TCS:coord.ra"
INS.SCAN1.DBTO   "@lshics2<alias>AFCS1.ra"
INS.SCAN2.DBFROM "<alias>TCS:coord.dec"
INS.SCAN2.DBTO   "@lshics2<alias>AFCS1.dec"
INS.SCAN3.DBFROM "<alias>TCS:track.adaPosAngle"
INS.SCAN3.DBTO   "@lshics2<alias>AFCS1.rotAngle"
INS.SCAN4.DBFROM "<alias>TCS:asm.pressure"
INS.SCAN4.DBTO   "@lshics2<alias>AFCS1.pressure"
INS.SCAN5.DBFROM "<alias>TCS:asm.temperature"
INS.SCAN5.DBTO   "@lshics2<alias>AFCS1.temperature"
INS.SCAN6.DBFROM "<alias>TCS:coord.prltic"
INS.SCAN6.DBTO   "@lshics2<alias>AFCS1.parallactic"
INS.SCAN7.DBFROM "<alias>TCS:coord.alt"
INS.SCAN7.DBTO   "@lshics2<alias>AFCS1.alt"

INS.SCAN8.DBFROM "<alias>TCS:coord.ra"
INS.SCAN8.DBTO   "@lshics2<alias>AFCS2.ra"
INS.SCAN9.DBFROM "<alias>TCS:coord.dec"
INS.SCAN9.DBTO   "@lshics2<alias>AFCS2.dec"
INS.SCAN10.DBFROM "<alias>TCS:track.adaPosAngle"
INS.SCAN10.DBTO   "@lshics2<alias>AFCS2.rotAngle"
INS.SCAN11.DBFROM "<alias>TCS:asm.pressure"
INS.SCAN11.DBTO   "@lshics2<alias>AFCS2.pressure"
INS.SCAN12.DBFROM "<alias>TCS:asm.temperature"
INS.SCAN12.DBTO   "@lshics2<alias>AFCS2.temperature"
INS.SCAN13.DBFROM "<alias>TCS:coord.prltic"
INS.SCAN13.DBTO   "@lshics2<alias>AFCS2.parallactic"
INS.SCAN14.DBFROM "<alias>TCS:coord.alt"
INS.SCAN14.DBTO   "@lshics2<alias>AFCS2.alt"


INS.SCAN15.DBFROM "<alias>TCS:coord.ra"
INS.SCAN15.DBTO   "@lshics2<alias>AFCS3.ra"
INS.SCAN16.DBFROM "<alias>TCS:coord.dec"
INS.SCAN16.DBTO   "@lshics2<alias>AFCS3.dec"
INS.SCAN17.DBFROM "<alias>TCS:track.adaPosAngle"
INS.SCAN17.DBTO   "@lshics2<alias>AFCS3.rotAngle"
INS.SCAN18.DBFROM "<alias>TCS:asm.pressure"
INS.SCAN18.DBTO   "@lshics2<alias>AFCS3.pressure"
INS.SCAN19.DBFROM "<alias>TCS:asm.temperature"
INS.SCAN19.DBTO   "@lshics2<alias>AFCS3.temperature"
INS.SCAN20.DBFROM "<alias>TCS:coord.prltic"
INS.SCAN20.DBTO   "@lshics2<alias>AFCS3.parallactic"
INS.SCAN21.DBFROM "<alias>TCS:coord.alt"
INS.SCAN21.DBTO   "@lshics2<alias>AFCS3.alt"


INS.SCAN22.DBFROM "<alias>TCS:coord.ra"
INS.SCAN22.DBTO   "@lshics1<alias>ADC1.ra"
INS.SCAN23.DBFROM "<alias>TCS:coord.dec"
INS.SCAN23.DBTO   "@lshics1<alias>ADC1.dec"
INS.SCAN24.DBFROM "<alias>TCS:coord.ra"
INS.SCAN24.DBTO   "@lshics1<alias>ADC2.ra"
INS.SCAN25.DBFROM "<alias>TCS:coord.dec"
INS.SCAN25.DBTO   "@lshics1<alias>ADC2.dec"
INS.SCAN26.DBFROM "<alias>TCS:coord.ra"
INS.SCAN26.DBTO   "@lshics1<alias>ADC3.ra"
INS.SCAN27.DBFROM "<alias>TCS:coord.dec"
INS.SCAN27.DBTO   "@lshics1<alias>ADC3.dec"
INS.SCAN28.DBFROM "<alias>TCS:coord.ra"
INS.SCAN28.DBTO   "@lshics1<alias>ADC4.ra"
INS.SCAN29.DBFROM "<alias>TCS:coord.dec"
INS.SCAN29.DBTO   "@lshics1<alias>ADC4.dec"


INS.SCAN30.DBFROM "<alias>TCS:track.adaPosAngle"
INS.SCAN30.DBTO   "@lshics1<alias>ADC1.adaPosAngle"
INS.SCAN31.DBFROM "<alias>TCS:asm.pressure"
```

```
INS.SCAN31.DBTO   "@lshics1<alias>ADC1.pressure"
INS.SCAN32.DBFROM "<alias>TCS:asm.temperature"
INS.SCAN32.DBTO   "@lshics1<alias>ADC1.temperature"
INS.SCAN33.DBFROM "<alias>TCS:coord.prltic"
INS.SCAN33.DBTO   "@lshics1<alias>ADC1.prltic"

INS.SCAN34.DBFROM "<alias>TCS:track.adaPosAngle"
INS.SCAN34.DBTO   "@lshics1<alias>ADC2.adaPosAngle"
INS.SCAN35.DBFROM "<alias>TCS:asm.pressure"
INS.SCAN35.DBTO   "@lshics1<alias>ADC2.pressure"
INS.SCAN36.DBFROM "<alias>TCS:asm.temperature"
INS.SCAN36.DBTO   "@lshics1<alias>ADC2.temperature"
INS.SCAN37.DBFROM "<alias>TCS:coord.prltic"
INS.SCAN37.DBTO   "@lshics1<alias>ADC2.prltic"

INS.SCAN38.DBFROM "<alias>TCS:track.adaPosAngle"
INS.SCAN38.DBTO   "@lshics1<alias>ADC3.adaPosAngle"
INS.SCAN39.DBFROM "<alias>TCS:asm.pressure"
INS.SCAN39.DBTO   "@lshics1<alias>ADC3.pressure"
INS.SCAN40.DBFROM "<alias>TCS:asm.temperature"
INS.SCAN40.DBTO   "@lshics1<alias>ADC3.temperature"
INS.SCAN41.DBFROM "<alias>TCS:coord.prltic"
INS.SCAN41.DBTO   "@lshics1<alias>ADC3.prltic"

INS.SCAN42.DBFROM "<alias>TCS:track.adaPosAngle"
INS.SCAN42.DBTO   "@lshics1<alias>ADC4.adaPosAngle"
INS.SCAN43.DBFROM "<alias>TCS:asm.pressure"
INS.SCAN43.DBTO   "@lshics1<alias>ADC4.pressure"
INS.SCAN44.DBFROM "<alias>TCS:asm.temperature"
INS.SCAN44.DBTO   "@lshics1<alias>ADC4.temperature"
INS.SCAN45.DBFROM "<alias>TCS:coord.prltic"
INS.SCAN45.DBTO   "@lshics1<alias>ADC4.prltic"

INS.SCAN46.DBFROM "<alias>TCS:asm.humidity"
INS.SCAN46.DBTO   "@lshics2<alias>AFCS1.rh"
INS.SCAN47.DBFROM "<alias>TCS:asm.humidity"
INS.SCAN47.DBTO   "@lshics2<alias>AFCS2.rh"
INS.SCAN48.DBFROM "<alias>TCS:asm.humidity"
INS.SCAN48.DBTO   "@lshics2<alias>AFCS3.rh"


#*****************************************************************************
# 5. OS configuration --> moved to INS_OS.cfg
#*****************************************************************************

#*****************************************************************************
# ___oOo___
```

9.2.2 shmcfgINS_OS.cfg

```
#*******************************************************************************
# E.S.O. - VLT project
#
# "@(#) $Id: shmcfgINS_OS.cfg,v 0.199 2009/03/23 15:15:11 vltsccm Exp $"
#
# who       when      what
# --------  --------  ----------------------------------------------
#
# santin    31/03/05  created, to split ICS and OS cfg files
#                     to be merged at the end ??
# vidali    01/04/05  decommented OCS.DET*.DBSTATE and OCS.DET*.DBEXPSTS
#                     for testing purpose
# vidali    07/04/05  DETi.OCS.UIFPOS keywords added
# vidali    12/04/05  PAF header added
# vidali    06/05/05  added configuration files in OCS.MODE*.SETUP
# santin    25/01/06  added CALIB and IMAG modes
# santin    12/02/08  added ICS as sub-system for CALIB mode
# mkiekebu 2008-05-13 added irace custom processes.

#*****************************************************************************
#

PAF.HDR.START;                  # Start of PAF Header
PAF.TYPE          "Configuration"; # Type of PAF
PAF.ID            "         ";   # ID for PAF
PAF.NAME          "         ";   # Name of PAF
PAF.DESC          "         ";   # Short description of PAF
PAF.CRTE.NAME     "         ";   # Name of creator
PAF.CRTE.DAYTIM   "         ";   # Civil Time for creation
PAF.LCHG.NAME     "         ";   # Name of person/appl. changing
PAF.LCHG.DAYTIM   "         ";   # Timestamp of last change
PAF.CHCK.NAME     "         ";   # Name of appl. checking
PAF.HDR.END;                    # End of PAF Header

#*****************************************************************************
# 5. OS configuration
#

OCS.CON.RELEASE          "2005-04-01"; # Release date "yyyy-mm-dd"
OCS.CON.ORIGIN          "TEST"; # Origin
OCS.CON.LOGLEVEL             0;

# telescope model parameters
#
OCS.TCCD.SCALE        0.1764;         # TCCD scale (arcsec/pix)
OCS.TRKWLEN             470;          # Telescope Tracking wavelength (nm)
OCS.ROTOFF            59.14;          # Rotator initial offset (deg)
OCS.FOCUSADA           5.66;          # Telescope Focus (mm)
OCS.VIGNX              90.0;          # vignetting area X (arcsec)
OCS.VIGNY              90.0;          # vignetting area Y (arcsec)
OCS.POINT.OFFX          0.0;          # point off-axis X (arcsec)
OCS.POINT.OFFY          0.0;          # point off-axis Y (arcsec)
#OCS.POINT.OFFY               -1.18;         # point off-axis Y (arcsec)

OCS.IFU.OFFUVB         -0.7;          # IFU offset (Y) to AFC subsys
OCS.IFU.OFFVIS          0.4;          # IFU offset (Y) to AFC subsys
OCS.IFU.OFFNIR         -0.4;          # IFU offset (X) to AFC subsys

OCS.PARK.INS         -151.0;          # Parking position of the Instrument
                                      # (rotator position)
#
# 5. OS Subsystems
#

#
# 5.1 OS telescope control subsystems
#
OCS.TEL.NAME          "UT2";                # Telescope name ('UT1','UT2','UT3' or 'UT4')
OCS.TEL.FOCUS         "CA";                 # Telescope focus
OCS.TEL.DICT           "TCS";                # dictionary
OCS.TEL.ENVNAME        "wt2tcs";             # TCS at Paranal
```

```
OCS.TEL.PROCNAME       "tifCA" ;              # process name
OCS.TEL.KEYWFILT       "TEL.*.*.*.*.*.*";     # keyword filter
OCS.TEL.TIMEOUT              600;                    # timeout in seconds
OCS.TEL.ID            "Tel name not set";    # value for TELESCOP kw ('ESO-VLT-Ui')

#
# 5.2 OS instrument control subsystems
#
#     Category indices are always removed before forwarding the FITS keyword.
#
OCS.INS.NUM            1;

# subsystem: ICS
# ------------------------------------------------------------------------------
OCS.INS1.NAME          "ICS";
OCS.INS1.DICT1          "SHOOT_ICS";
OCS.INS1.ENVNAME       "wshoot";
OCS.INS1.PROCNAME      "shiControl";
#OCS.INS1.DBROOT         "<alias>SHOOT:ICS";             # db root ( default)
#OCS.INS1.DBIFROOT       "<alias>sho:subsystems:ics";   # interface db address (default)
#OCS.INS1.DBSTATE        "<alias>SHOOT:ICS:PROCESSES:WS:icsControl.state";
OCS.INS1.KEYWFILT       "INS.*.*.*.*.*.*";
OCS.INS1.TIMEOUT       120;                          # timeout in seconds

OCS.INS1.STRTUIF       F;


#
# 5.3 OS detector control subsystems
#
#     Category indices are always removed before forwarding the FITS keyword.
#
OCS.DET.NUM            4;

# subsystem: DET1 FIERA
# ------------------------------------------------------------------------------
OCS.DET1.NAME         "SHDETB" ;
OCS.DET1.DICT         "FCDDCS";
OCS.DET1.ENVNAME      "wshoot";
OCS.DET1.PROCNAME     "fcdconCI_shdetb";
OCS.DET1.KEYWFILT     "DET1.*.*.*.*.*.*";
OCS.DET1.TIMEOUT      20;                    # timeout in seconds
OCS.DET1.DBROOT       "<alias>shdetb";
OCS.DET1.TYPE        "FIERA";
OCS.DET1.CCDNAME      "shdetb";
OCS.DET1.CCDLENV      "wshubv";
OCS.DET1.DBFILE             "fcdSciShdetb.dbcfg";
OCS.DET1.STOP        "F";
OCS.UIF.DET1.UIFPOS       4;
OCS.UIF.DET1.UIFNAME      "UVB";
OCS.UIF.DET1.UIFLEDMIN     0;
OCS.UIF.DET1.UIFLEDMAX     0.99;
OCS.UIF.DET1.UIFLEDCWP     "<alias>fieraUvbAlarm.chipUvbAlarm"
OCS.UIF.DET1.ALRMMIN      134;
OCS.UIF.DET1.ALRMMAX      136;
OCS.UIF.DET1.ALRMCWP      "<alias>fieraUvbAlarm"



# subsystem: DET2 FIERA
# ------------------------------------------------------------------------------
OCS.DET2.NAME         "SHDETV" ;
OCS.DET2.DICT         "FCDDCS";
OCS.DET2.ENVNAME      "wshoot";
OCS.DET2.PROCNAME     "fcdconCI_shdetv";
OCS.DET2.KEYWFILT     "DET2.*.*.*.*.*.*";
OCS.DET2.TIMEOUT      20;                    # timeout in seconds
OCS.DET2.DBROOT       "<alias>shdetv";
OCS.DET2.TYPE        "FIERA";
OCS.DET2.CCDNAME      "shdetv";
OCS.DET2.CCDLENV      "wshubv";
OCS.DET2.DBFILE             "fcdSciShdetv.dbcfg";
OCS.DET2.STOP        "F";
OCS.UIF.DET2.UIFPOS   4;
OCS.UIF.DET2.UIFNAME      "VIS";
```

```
OCS.UIF.DET2.UIFLEDMIN    0;
OCS.UIF.DET2.UIFLEDMAX    0.99;
OCS.UIF.DET2.UIFLEDCWP    "<alias>fieraVisAlarm.chipVisAlarm"
OCS.UIF.DET2.ALRMMIN     134;
OCS.UIF.DET2.ALRMMAX     136;
OCS.UIF.DET2.ALRMCWP     "<alias>fieraVisAlarm"


# subsystem: DET3  IRACE
# ------------------------------------------------------------------------------
OCS.DET3.NAME         "SHDETR";                                  # name of the IRACE detector
OCS.DET3.DICT         "IRACE";                                  # dictionary : ESO-VLT-DICT.IRACE
OCS.DET3.ENVNAME      "wshoot";                                  # environment where proc. is running
OCS.DET3.PROCNAME     "shdnirServer";                           # name of the IRACE detector process
OCS.DET3.KEYWFILT     "DET3.*.*.*.*.*.*";                       # keywords forwarded to subsystem
OCS.DET3.TIMEOUT      20;                                       # timeout for the process (seconds)
OCS.DET3.DBROOT        "<alias>iracq";                          # db Root
OCS.DET3.TYPE        "IRACE";
OCS.DET3.SDMAHOST     "wshnir";
OCS.DET3.SYSCFG             "sys.cfg";
OCS.DET3.DTT          "shdnirDtt";                               # Custom DTT process
OCS.UIF.DET3.UIFPOS      4
OCS.UIF.DET3.UIFNAME     "NIR"

# subsystem: DET4 TCCD
# ------------------------------------------------------------------------------
OCS.DET4.NAME        "SHTCCD";                                    # name of the tech. detector
OCS.DET4.DICT1       "CCDDCS";                                  # dictionary : ESO-VLT-DICT.CCDDCS
OCS.DET4.ENVNAME     "wshoot";                                    # environment
OCS.DET4.PROCNAME    "ccdconCI_shtccd";                           # name of the  process
OCS.DET4.KEYWFILT    "DET4.*.*.*.*.*.*,DET.*.*.*.*.*.*";        # keywords forwarded to subsystem
OCS.DET4.TIMEOUT     20;                                        # timeout in seconds
OCS.DET4.DBROOT       "<alias>shtccd";                            # db address of subsystem
OCS.DET4.TYPE       "ACE";
OCS.DET4.CCDNAME     "shtccd";
OCS.DET4.CCDLENV     "lshtccd";
OCS.DET4.DBFILE            "ccdTecE2V57I_ENG.dbcfg";
OCS.UIF.DET4.UIFNAME "A&G"

#
# 5.4 OS observation software subsystems
#
OCS.OS.NUM            0;

#
# 5.5 Instrument modes
# ------------------------------------------------------------------------------
#

OCS.MODE1.NAME       "SLITSPEC";             # Standard Slit Spectroscopy
OCS.MODE1.SETUP      ""
OCS.MODE1.SUBSYST    "SHDETB SHDETV SHDETR SHTCCD UT3 ICS";     # subsystems involved in the given mode
OCS.MODE1.PATH       "SLITSPEC";        # instrument path (EXPSTRT, EXPEND)

OCS.MODE2.NAME       "IFUSPEC";         # Integral Field Spectroscopy
OCS.MODE2.SETUP      ""
OCS.MODE2.SUBSYST    "SHDETB SHDETV SHDETR SHTCCD UT3 ICS";     # subsystems involved in the given mode
OCS.MODE2.PATH       "IFUSPEC";          # instrument path (EXPSTRT, EXPEND)

OCS.MODE3.NAME       "IMAG";             # Imaging (with TCCD)
OCS.MODE3.SETUP      ""
OCS.MODE3.SUBSYST    "SHTCCD ICS UT3";
OCS.MODE3.PATH       "IMAG";

OCS.MODE4.NAME       "CALIB";             # CCD calibrations (dark, bias, ccdflat)
OCS.MODE4.SETUP      ""
OCS.MODE4.SUBSYST    "ICS SHDETB SHDETV SHDETR SHTCCD UT3";
OCS.MODE4.PATH       "CALIB";

#*********************************************************************
# 6. Midas
#
# Normally, image processing is done by the pipeline.
# On-line MIDAS should be enabled only if needed.
#
```

```
START.MIDAS.AVAIL  F;

#*********************************************************************
# 7. Additional panels
#

START.PANEL1.NAME    "ALARM"; # Panel name
START.PANEL1.EXECMD  "shopanAlarm"; # Command to start the panel
START.PANEL1.DESC    "SHOOT Alarms"
START.PANEL1.DEFAULT F;

START.PANEL2.NAME    "OS_ENGINEERING"; # Panel name
START.PANEL2.EXECMD  "shopanEngineering"; # Command to start the panel
START.PANEL2.DESC    "SHOOT OS Engineering"
START.PANEL2.DEFAULT F;

START.PANEL3.NAME    "AG_CONTROL"; # Panel name
START.PANEL3.EXECMD  "shortd"; # Command to start the panel
START.PANEL3.DESC    "SHOOT AG Control"
START.PANEL3.DEFAULT F;

START.PANEL4.NAME    "SENSORS_PLOT"; # Panel name
START.PANEL4.EXECMD  "shipanSensorsPlot"; # Command to start the panel
START.PANEL4.DESC    "SHOOT Sensors Plot"
START.PANEL4.DEFAULT F;

START.BOB.STOP       F; for RRM mode

#*********************************************************************
# ___oOo___
```

9.2.3 shmcfgINS.DCS.cfg

```
#*******************************************************************************
# E.S.O. - VLT project
#
# "@(#) $Id: shmcfgINS_DCS.cfg,v 0.199 2009/03/23 15:15:11 vltsccm Exp $"
#
# who       when        what
# --------  ----------  ----------------------------------------------
# mkiekebu 2008-01-16   created
#
#*******************************************************************************
#
PAF.HDR.START;                 # Start of PAF Header
PAF.TYPE          "Configuration"; # Type of PAF
PAF.ID            "         ";   # ID for PAF
PAF.NAME          "         ";   # Name of PAF
PAF.DESC          "         ";   # Short description of PAF
PAF.CRTE.NAME     "         ";   # Name of creator
PAF.CRTE.DAYTIM   "         ";   # Civil Time for creation
PAF.LCHG.NAME     "         ";   # Name of person/appl. changing
PAF.LCHG.DAYTIM   "         ";   # Timestamp of last change
PAF.CHCK.NAME     "         ";   # Name of appl. checking
PAF.HDR.END;                   # End of PAF Header


#DET.CON.DTT.DISPLAY  T;
DET.CON.DTT.CAMERA   "shdetr_clip";


#*******************************************************************************
# ___oOo___
```

9.2.4 shmcfgMAG_CALC.cfg

```
#*******************************************************************************
# E.S.O. - VLT project
#
# "@(#) $Id: shmcfgMAG_CALC.cfg,v 0.199 2009/03/23 15:15:11 vltsccm Exp $"
#
#*******************************************************************************
# who       when      what
# --------  --------  ----------------------------------------------
# dimarcan  05/07/07  created
#


PAF.HDR.START           "";           # Start of PAF Header
PAF.TYPE                "Configuration"; # Type of PAF
PAF.ID                  "        ";   # ID for PAF
PAF.NAME                "        ";   # Name of PAF
PAF.DESC                "        ";   # Short description of PAF
PAF.CRTE.NAME           "        ";   # Name of creator
PAF.CRTE.DAYTIM         "        ";   # Civil Time for creation
PAF.LCHG.NAME           "Config. Tool";      # Name of person/appl. changing
PAF.LCHG.DAYTIM         "2001-08-28T18:36:33"; # Timestamp of last change
PAF.CHCK.NAME           "        ";   # Name of appl. checking
PAF.HDR.END             "";           # End of PAF Header


INS.FILT1.POSNUM          12;  # number of scientific available filters

# CAUTION:
# filter names are defined only in shmcfgINS.cfg
# if names has to be changed, please change accordingly also the zeropoint numbering


INS.FILT1.ZP1             1.1;
INS.FILT1.ZP2             2.2;
INS.FILT1.ZP3             3.3;
INS.FILT1.ZP4             4.4;
INS.FILT1.ZP5             5.5;
INS.FILT1.ZP6             28.266;
INS.FILT1.ZP7             7.7;
INS.FILT1.ZP8             28.481;
INS.FILT1.ZP9             28.350;
INS.FILT1.ZP10            10.1;
INS.FILT1.ZP11            27.872;
INS.FILT1.ZP12            12.2;


# ___oOo___
```

9.2.5 shmcfgAFCRef_UVB.cfg

```
#*******************************************************************************
# E.S.O. - VLT project
#
# "@(#) $Id: shmcfgAFCRef_UVB.cfg,v 0.199 2009/03/23 15:15:11 vltsccm Exp $"
#
#*******************************************************************************
# who       when      what
# --------  --------  ----------------------------------------------
# santin    11/08/07  created
#


PAF.HDR.START           "";           # Start of PAF Header
PAF.TYPE                "Configuration"; # Type of PAF
PAF.ID                  "         ";   # ID for PAF
PAF.NAME                "         ";   # Name of PAF
PAF.DESC                "         ";   # Short description of PAF
PAF.CRTE.NAME           "         ";   # Name of creator
PAF.CRTE.DAYTIM         "         ";   # Civil Time for creation
PAF.LCHG.NAME           "Config. Tool";      # Name of person/appl. changing
PAF.LCHG.DAYTIM         "2001-08-28T18:36:33"; # Timestamp of last change
PAF.CHCK.NAME           "         ";   # Name of appl. checking
PAF.HDR.END             "";           # End of PAF Header

OCS.AFCREF.UVB.NO               "1";  # no. of reference points (x,y)
OCS.AFCREF.UVB.PARX1          "250";  # reference coordinates
OCS.AFCREF.UVB.PARY1          "440";

# pixel to voltage conversion parameters
OCS.AFCREF.UVB.PAR1            "0.09671";
OCS.AFCREF.UVB.PAR2            "-0.69377";
OCS.AFCREF.UVB.PAR3            "0.60547";
OCS.AFCREF.UVB.PAR4            "0.0042";


# ___oOo___
```

9.2.6 shmcfgAFCRef.cfg

```
#*******************************************************************************
# E.S.O. - VLT project
#
# "@(#) $Id: shmcfgAFCRef_VIS.cfg,v 0.199 2009/03/23 15:15:11 vltsccm Exp $"
#
#*******************************************************************************
# who       when      what
# --------  --------  ----------------------------------------------
# santin    11/08/07  created
#


PAF.HDR.START           "";           # Start of PAF Header
PAF.TYPE                "Configuration"; # Type of PAF
PAF.ID                  "         ";   # ID for PAF
PAF.NAME                "         ";   # Name of PAF
PAF.DESC                "         ";   # Short description of PAF
PAF.CRTE.NAME           "         ";   # Name of creator
PAF.CRTE.DAYTIM         "         ";   # Civil Time for creation
PAF.LCHG.NAME           "Config. Tool";      # Name of person/appl. changing
PAF.LCHG.DAYTIM         "2001-08-28T18:36:33"; # Timestamp of last change
PAF.CHCK.NAME           "         ";   # Name of appl. checking
PAF.HDR.END             "";           # End of PAF Header

OCS.AFCREF.VIS.NO               "1";  # no. of reference points (x,y)
OCS.AFCREF.VIS.PARX1          "335";  # reference coordinates
OCS.AFCREF.VIS.PARY1          "491";

# pixel to voltage conversion parameters
OCS.AFCREF.VIS.PAR1            "0.0598";
OCS.AFCREF.VIS.PAR2            "-0.4344";
OCS.AFCREF.VIS.PAR3            "0.40098";
OCS.AFCREF.VIS.PAR4            "0.02814";


# ___oOo___
```

9.2.7 shmcfgAFCRef_NIR.cfg

```
#*******************************************************************************
# E.S.O. - VLT project
#
# "@(#) $Id: shmcfgAFCRef_NIR.cfg,v 0.199 2009/03/23 15:15:11 vltsccm Exp $"
#
#*******************************************************************************
# who       when      what
# --------  --------  ----------------------------------------------
# santin    11/08/07  created
#


PAF.HDR.START           "";           # Start of PAF Header
PAF.TYPE                "Configuration"; # Type of PAF
PAF.ID                  "         ";   # ID for PAF
PAF.NAME                "         ";   # Name of PAF
PAF.DESC                "         ";   # Short description of PAF
PAF.CRTE.NAME           "         ";   # Name of creator
PAF.CRTE.DAYTIM         "         ";   # Civil Time for creation
PAF.LCHG.NAME           "Config. Tool";      # Name of person/appl. changing
PAF.LCHG.DAYTIM         "2001-08-28T18:36:33"; # Timestamp of last change
PAF.CHCK.NAME           "         ";   # Name of appl. checking
PAF.HDR.END             "";           # End of PAF Header

OCS.AFCREF.NIR.NO               "1";  # no. of reference points (x,y)
OCS.AFCREF.NIR.PARX1          "873";  # reference coordinates
OCS.AFCREF.NIR.PARY1          "546";

# pixel to voltage conversion parameters
OCS.AFCREF.NIR.PAR1            "-0.05136";
OCS.AFCREF.NIR.PAR2            "-0.3936";
OCS.AFCREF.NIR.PAR3            "-0.367" ;
OCS.AFCREF.NIR.PAR4            "0.050145";

# ___oOo___
```

9.3 Instrument Setup File

```
#*******************************************************************************
# E.S.O. - VLT project
#
# "@(#) $Id: shmcfgSetupComplete.ins,v 0.199 2009/03/23 15:15:11 vltsccm Exp $"
#
# who         when      what
# ----------  --------  ----------------------------------------------
# alongino    04/01/01  created
# vidali      01/09/05  Adapted to SHOOT
# santin      24/03/06  Full Setup implemented
#
#*******************************************************************************

PAF.HDR.START;                  # Start of PAF Header
PAF.TYPE          "Instrument Setup"; # Type of PAF
PAF.ID            "         ";   # ID for PAF
PAF.NAME          "         ";   # Name of PAF
PAF.DESC          "         ";   # Short description of PAF
PAF.CRTE.NAME     "         ";   # Name of creator
PAF.CRTE.DAYTIM   "         ";   # Civil Time for creation
PAF.LCHG.NAME     "         ";   # Name of person/appl. changing
PAF.LCHG.DAYTIM   "         ";   # Timestamp of last change
PAF.CHCK.NAME     "         ";   # Name of appl. checking
PAF.HDR.END;                    # End of PAF Header
#
#

INS.MODE           "SLITSPEC"; # SLITSPEC/IFUSPEC/IMAG/CALIB - Instrument Mode
#
INS.SHUT1.ST              "T"; # T/F - Instrument Shutter
INS.MIRR1.NAME          "Tel"; # Tel/ThAr_D2/Sphere/AFC
                               # Calibration mirror slide
#
# Cal system
#
INS.LAMP1.ST              "F"; # T/F - ThAr_Lamp     - Spectral UVB/VIS
INS.LAMP2.ST              "F"; # T/F - ArKrNeXe_Lamp - Spectral NIR / Sphere
INS.LAMP3.ST              "F"; # T/F - UVB_Low_D2    - FF UVB Low
INS.LAMP4.ST              "F"; # T/F - UVB_High      - FF UVB High  / Sphere
INS.LAMP5.ST              "F"; # T/F - VIS_FF_lamp   - FF VIS              / Sphere
INS.LAMP6.ST              "F"; # T/F - NIR_FF_lamp   - FF NIR              / Sphere
#
INS.LAMP                "OFF"; # Assembly to switch all lamps OFF
#
# BB functions
#
INS.OPTI2.NAME          "MIR"; # MIR/PIN/SLOT/PEL/IFU - A&G slide
INS.FILT1.NAME            "U"; # PV(V)/u'/g'/r'/i'/z'/U/B/V/R/I/PV(B)
                               # A&G filter 12 positions

# Assembly to control simultaneously
INS.ADCB               "AUTO"; # OFF/AUTO - UVB ADC (assembly)
INS.ADCV               "AUTO"; # OFF/AUTO - VIS ADC (assembly)

INS.TILT1.MODE         "AUTO"; # AUTO/REF/PARK/STAT - AFCS piezo #1 - UVB
INS.TILT2.MODE         "AUTO"; # AUTO/REF/PARK/STAT - AFCS piezo #2 - VIS
INS.TILT3.MODE         "AUTO"; # AUTO/REF/PARK/STAT - AFCS piezo #3 - NIR

#
# UVB Spectrograph
#
INS.OPTI3.NAME       "1.0x11"; # 0.5x11/0.8x11/1.0x11/1.3x11/1.6x11/5.0x11/
                               # 1.0x12.6/Pin_0.5/Pin_row
                             # UVB Slit 9 pos
INS.FOCU1.POS           20.5;  # UVB Focus - Temperature continuous value (C)

# VIS Spectrograph
#
INS.OPTI4.NAME       "1.2x11"; # 0.4x11/0.7x11/0.9x11/1.2x11/1.5x11/5.0x11/
                               # 1.0x12.6/Pin_0.5/Pin_row
                             # VIS Slit 9 pos
INS.FOCU2.POS            20.5; # VIS Focus - Temperature continuous value (C)
```

```
#
# NIR Spectrograph
#
INS.OPTI5.NAME       "1.2x11"; # 0.4x11/0.6x11/0.9x11/1.2x11/1.5x11/5.0x11/
                               # 1.0x12.6/Pin_0.4/Pin_0.5/Pin_row/
                                    # Tilt_slit/Blind
                               # NIR 12 Slit positions
#
#*******************************

# --- oOo ---
```

10 Templates

A complete description of the Instrument Templates and of the related parameters is presented in **[AD 13]**.

11 FITS files

11.1 Example of FITS header

The following is an example of a header FITS of an image, result of a scientific exposure taken with the template *SHOOT_slt_obs_Stare,* during the integration at ESO/Garching..
The instrument is in the integration phase, with telescope simulation.

```
SIMPLE  =                    T          / Standard FITS format (NOST-100.0)
BITPIX  =                   16          / # of bits storing pix values
NAXIS   =                    2          / # of axes in frame
NAXIS1  =                 2144          / # pixels/axis
NAXIS2  =                 4000          / # pixels/axis
EXTEND  =                    T / Extension may be present
PCOUNT  =                    0          / Number of parameters per group
GCOUNT  =                    1          / Number of groups
BZERO   =              32768.0          / pixel=FITS*BSCALE+BZERO
BSCALE  =                  1.0          / pixel=FITS*BSCALE+BZERO
ORIGIN  = 'TEST    '                    / European Southern Observatory
DATE    = '2008-05-07T16:09:54.980'     / UT date when this file was written
TELESCOP= 'Tel name not set'            / ESO Telescope Name
INSTRUME= 'SHOOT   '                    / Instrument used.
OBJECT  = '        '           / Original target.
EXPTIME =               1.0000          / Total integration time
MJD-OBS =       54593.67351221          / MJD start (2008-05-07T16:09:51.455)
DATE-OBS= '2008-05-07T16:09:51.455'     / Date of observation
PI-COI  = 'Condor  '            / PI-COI name.
CTYPE1  = 'PIXEL   '                    / Pixel coordinate system
CTYPE2  = 'PIXEL   '                    / Pixel coordinate system
CRVAL1  =                  1.0          / value of ref pixel
CRVAL2  =                  1.0          / value of ref pixel
CRPIX1  =                  0.0          / Ref. pixel of center of rotation
CRPIX2  =                  0.0          / Ref. pixel of center of rotation
CDELT1  =                  1.0          / Binning factor
CDELT2  =                  1.0          / Binning factor
HIERARCH ESO DET BITS         =           16 / Bits per pixel readout
HIERARCH ESO DET CHIP1 DATE   = '2005-04-22' / Date of installation [YYYY-MM-DD]
HIERARCH ESO DET CHIP1 ID     = 'CCID-20 '   / Detector chip identification
HIERARCH ESO DET CHIP1 INDEX  =            1 / Chip index
HIERARCH ESO DET CHIP1 NAME   = 'MIT/LL CCID-20' / Detector chip name
HIERARCH ESO DET CHIP1 NX     =         2048 / # of pixels along X
HIERARCH ESO DET CHIP1 NY     =         4102 / # of pixels along Y
HIERARCH ESO DET CHIP1 PSZX   =         15.0 / Size of pixel in X
HIERARCH ESO DET CHIP1 PSZY   =         15.0 / Size of pixel in Y
HIERARCH ESO DET CHIP1 X      =            1 / X location in array
HIERARCH ESO DET CHIP1 XGAP   =     0.000000 / Gap between chips along x
HIERARCH ESO DET CHIP1 Y      =            1 / Y location in array
HIERARCH ESO DET CHIP1 YGAP   =     0.000000 / Gap between chips along y
HIERARCH ESO DET CHIPS        =            1 / # of chips in detector array
HIERARCH ESO DET DATE         = '2005-22-04' / Installation date
HIERARCH ESO DET DEC          =   0.00000000 / Apparent 00:00:00.0 DEC at start
HIERARCH ESO DET DID          = 'ESO-VLT-DIC.CCDDCS,ESO-VLT-DIC.FCDDCS' / Dictio
HIERARCH ESO DET EXP NO       =          201 / Unique exposure ID number
HIERARCH ESO DET EXP RDTTIME  =        4.320 / image readout time
HIERARCH ESO DET EXP TYPE     = 'Normal  '   / Exposure type
HIERARCH ESO DET EXP XFERTIM  =       34.537 / image transfer time
HIERARCH ESO DET FRAM ID      =            1 / Image sequencial number
HIERARCH ESO DET FRAM TYPE    = 'Normal  '   / Type of frame
HIERARCH ESO DET ID           = 'CCD FIERA - Rev: 3.96 ' / Detector system Id
HIERARCH ESO DET NAME         = 'shdetv - shdetv' / Name of detector system
HIERARCH ESO DET OUT1 CHIP    =            1 / Chip to which the output belongs
HIERARCH ESO DET OUT1 CONAD   =         1.82 / Conversion from ADUs to electrons
HIERARCH ESO DET OUT1 GAIN    =         0.55 / Conversion from electrons to ADU
HIERARCH ESO DET OUT1 ID      = 'A       '   / Output ID as from manufacturer
HIERARCH ESO DET OUT1 INDEX   =            1 / Output index
HIERARCH ESO DET OUT1 NAME    = 'A       '   / Description of output
HIERARCH ESO DET OUT1 NX      =         2044 / valid pixels along X
HIERARCH ESO DET OUT1 NY      =         3800 / valid pixels along Y
HIERARCH ESO DET OUT1 OVSCX   =           50 / Overscan region in X
HIERARCH ESO DET OUT1 OVSCY   =          200 / Overscan region in Y
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HIERARCH ESO DET OUT1 PRSCX  =           50 / Prescan region in X
HIERARCH ESO DET OUT1 PRSCY  =            0 / Prescan region in Y
HIERARCH ESO DET OUT1 RON    =         5.40 / Readout noise per output (e-)
HIERARCH ESO DET OUT1 X      =            1 / X location of output
HIERARCH ESO DET OUT1 Y      =            1 / Y location of output
HIERARCH ESO DET OUTPUTS     =            1 / # of outputs
HIERARCH ESO DET OUTREF      =            0 / reference output
HIERARCH ESO DET RA          =   0.00000000 / Apparent 00:00:00.0 RA at start
HIERARCH ESO DET READ CLOCK  = '400k/1pt/lg' / Readout clock pattern used
HIERARCH ESO DET READ MODE   = 'normal  '   / Readout method
HIERARCH ESO DET READ NFRAM  =            1 / Number of readouts buffered in si
HIERARCH ESO DET READ SPEED  = '1pt/400k/lg' / Readout speed
HIERARCH ESO DET SHUT ID     = 'Test Shutter' / Shutter unique identifier
HIERARCH ESO DET SHUT TMCLOS =        0.000 / Time taken to close shutter
HIERARCH ESO DET SHUT TMOPEN =        0.000 / Time taken to open shutter
HIERARCH ESO DET SHUT TYPE   = 'slit    '   / type of shutter
HIERARCH ESO DET SOFW MODE   = 'Normal  '   / CCD sw operational mode
HIERARCH ESO DET TELE INT    =        600.0 / Interval between two successive t
HIERARCH ESO DET TELE NO     =            4 / # of sources active
HIERARCH ESO DET TLM1 END    =       135.00 / Telemetry value at read completio
HIERARCH ESO DET TLM1 ID     = 'CCD Sensor1' / ID of telemetry sensor
HIERARCH ESO DET TLM1 NAME   = 'CCD T1  '   / Description of telemetry param.
HIERARCH ESO DET TLM1 START  =       135.00 / Telemetry value at read start
HIERARCH ESO DET TLM2 END    =       143.70 / Telemetry value at read completio
HIERARCH ESO DET TLM2 ID     = 'CCD Sensor2' / ID of telemetry sensor
HIERARCH ESO DET TLM2 NAME   = 'CCD T2  '   / Description of telemetry param.
HIERARCH ESO DET TLM2 START  =       143.70 / Telemetry value at read start
HIERARCH ESO DET TLM3 END    =         0.00 / Telemetry value at read completio
HIERARCH ESO DET TLM3 ID     = 'Box Temp'   / ID of telemetry sensor
HIERARCH ESO DET TLM3 NAME   = 'EBOX T  '   / Description of telemetry param.
HIERARCH ESO DET TLM3 START  =         0.00 / Telemetry value at read start
HIERARCH ESO DET TLM4 END    =         0.00 / Telemetry value at read completio
HIERARCH ESO DET TLM4 ID     = 'Vacuum  '   / ID of telemetry sensor
HIERARCH ESO DET TLM4 NAME   = 'Vacuum  '   / Description of telemetry param.
HIERARCH ESO DET TLM4 START  =         0.00 / Telemetry value at read start
HIERARCH ESO DET WIN1 BINX   =            1 / Binning factor along X
HIERARCH ESO DET WIN1 BINY   =            1 / Binning factor along Y
HIERARCH ESO DET WIN1 DIT1   =     1.000000 / actual subintegration time
HIERARCH ESO DET WIN1 DKTM   =       1.8602 / Dark current time
HIERARCH ESO DET WIN1 NDIT   =            1 / # of subintegrations
HIERARCH ESO DET WIN1 NX     =         2144 / # of pixels along X
HIERARCH ESO DET WIN1 NY     =         4000 / # of pixels along Y
HIERARCH ESO DET WIN1 ST     =            T / If T, window enabled
HIERARCH ESO DET WIN1 STRX   =            1 / Lower left pixel in X
HIERARCH ESO DET WIN1 STRY   =            1 / Lower left pixel in Y
HIERARCH ESO DET WIN1 UIT1   =     1.000000 / user defined subintegration time
HIERARCH ESO DET WINDOWS     =            1 / # of windows readout
HIERARCH ESO DPR CATG        = 'SCIENCE '   / Observation category
HIERARCH ESO DPR TECH        = 'ECHELLE,SLIT,STARE' / Observation technique
HIERARCH ESO DPR TYPE        = 'OBJECT  '   / Observation type
HIERARCH ESO INS ADC1 DEC    =      0.00000 / Telescope desclination [deg].
HIERARCH ESO INS ADC1 END    =     189.0000 / Position angle at end [deg].
HIERARCH ESO INS ADC1 MODE   = 'AUTO    '   / ADC mode.
HIERARCH ESO INS ADC1 RA     =     0.000000 / Telescope right ascension [deg].
HIERARCH ESO INS ADC2 DEC    =      0.00000 / Telescope desclination [deg].
HIERARCH ESO INS ADC2 END    =     188.7700 / Position angle at end [deg].
HIERARCH ESO INS ADC2 MODE   = 'AUTO    '   / ADC mode.
HIERARCH ESO INS ADC2 RA     =     0.000000 / Telescope right ascension [deg].
HIERARCH ESO INS ADC3 DEC    =      0.00000 / Telescope desclination [deg].
HIERARCH ESO INS ADC3 END    =     198.3800 / Position angle at end [deg].
HIERARCH ESO INS ADC3 MODE   = 'AUTO    '   / ADC mode.
HIERARCH ESO INS ADC3 RA     =     0.000000 / Telescope right ascension [deg].
HIERARCH ESO INS ADC4 DEC    =      0.00000 / Telescope desclination [deg].
HIERARCH ESO INS ADC4 END    =     193.2950 / Position angle at end [deg].
HIERARCH ESO INS ADC4 MODE   = 'AUTO    '   / ADC mode.
HIERARCH ESO INS ADC4 RA     =     0.000000 / Telescope right ascension [deg].
HIERARCH ESO INS DATE        = '2005-04-01' / Instrument release date (yyyy-mm-
HIERARCH ESO INS DID         = 'ESO-VLT-DIC.SHOOT_ICS-0.38' / Data dictionary f
HIERARCH ESO INS FILT1 ID    = 'PS9     '   / Filter unique id.
HIERARCH ESO INS FILT1 NAME  = 'V       '   / Filter name.
HIERARCH ESO INS FILT1 NO    =            9 / Filter wheel position index.
HIERARCH ESO INS FOCU1 ENC   =        22500 / Absolute position [Enc].
HIERARCH ESO INS FOCU1 POS   =          3.3 / Position [C].
HIERARCH ESO INS FOCU2 ENC   =        11750 / Absolute position [Enc].
HIERARCH ESO INS FOCU2 POS   =          1.7 / Position [C].
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HIERARCH ESO INS ID          = 'SHOOT/1.57' / Instrument ID.
HIERARCH ESO INS MIRR1 ID    = 'Tel     '   / Mirror unique ID.
HIERARCH ESO INS MIRR1 NAME  = 'Tel     '   / Mirror name.
HIERARCH ESO INS MIRR1 NO    =           1 / Mirror slide position.
HIERARCH ESO INS MODE        = 'SLITSPEC'   / Instrument mode used.
HIERARCH ESO INS OPTI2 ID    = 'SLOT    '   / OPTIi unique ID.
HIERARCH ESO INS OPTI2 NAME  = 'SLOT    '   / OPTIi name.
HIERARCH ESO INS OPTI2 NO    =           3 / OPTIi slot number.
HIERARCH ESO INS OPTI2 TYPE  = 'MIRROR  '   / OPTIi element.
HIERARCH ESO INS OPTI3 ID    = 'PS7     '   / OPTIi unique ID.
HIERARCH ESO INS OPTI3 NAME  = '1.0x12  '   / OPTIi name.
HIERARCH ESO INS OPTI3 NO    =           7 / OPTIi slot number.
HIERARCH ESO INS OPTI3 TYPE  = 'SLIT    '   / OPTIi element.
HIERARCH ESO INS OPTI4 ID    = 'PS7     '   / OPTIi unique ID.
HIERARCH ESO INS OPTI4 NAME  = '1.0x12  '   / OPTIi name.
HIERARCH ESO INS OPTI4 NO    =           7 / OPTIi slot number.
HIERARCH ESO INS OPTI4 TYPE  = 'SLIT    '   / OPTIi element.
HIERARCH ESO INS OPTI5 ID    = 'PS12    '   / OPTIi unique ID.
HIERARCH ESO INS OPTI5 NAME  = '0.6x12  '   / OPTIi name.
HIERARCH ESO INS OPTI5 NO    =          12 / OPTIi slot number.
HIERARCH ESO INS OPTI5 TYPE  = 'SLIT    '   / OPTIi element.
HIERARCH ESO INS PATH        = 'SLITSPEC'   / Optical path used.
HIERARCH ESO INS SENS60 ID   = 'NPM     '   / sensor ID.
HIERARCH ESO INS SENS60 NAME = 'NIR Cryostat Pressure' / sensor common name.
HIERARCH ESO INS SENS60 VAL  = 0.0000063600 / Sensor numeric value.
HIERARCH ESO INS SENSOR5 SWSIM=           T / If T, function is software simula
HIERARCH ESO INS SHUT1 ID    = 'INSH    '   / Shutter ID.
HIERARCH ESO INS SHUT1 NAME  = 'Instrument shutter' / Shutter name.
HIERARCH ESO INS SHUT1 ST    =           T / Shutter open.
HIERARCH ESO INS SHUT1 SWSIM =           T / If T, function is software simula
HIERARCH ESO INS SWSIM       = 'NORMAL  '   / Software simulation.
HIERARCH ESO INS TEMP1 ID    = 'TMA     '   / Temperature sensor ID.
HIERARCH ESO INS TEMP1 NAME  = 'Air temp.'  / Temperature sensor name.
HIERARCH ESO INS TEMP1 VAL   =      32.200 / Temperature sensor numeric value.
HIERARCH ESO INS TEMP10 ID   = 'TCAB3   '   / Temperature sensor ID.
HIERARCH ESO INS TEMP10 NAME = 'Cabinet Temp. #3' / Temperature sensor name.
HIERARCH ESO INS TEMP10 VAL  =         nan / Temperature sensor numeric value.
HIERARCH ESO INS TEMP11 ID   = 'CAB4    '   / Temperature sensor ID.
HIERARCH ESO INS TEMP11 NAME = 'Cabinet Temp. #4' / Temperature sensor name.
HIERARCH ESO INS TEMP11 VAL  =         nan / Temperature sensor numeric value.
HIERARCH ESO INS TEMP12 ID   = 'SPR1    '   / Temperature sensor ID.
HIERARCH ESO INS TEMP12 NAME = 'Spare   '   / Temperature sensor name.
HIERARCH ESO INS TEMP12 VAL  =         nan / Temperature sensor numeric value.
HIERARCH ESO INS TEMP2 ID    = 'TMSFE   '   / Temperature sensor ID.
HIERARCH ESO INS TEMP2 NAME  = 'SFE temp.'  / Temperature sensor name.
HIERARCH ESO INS TEMP2 VAL   =      30.610 / Temperature sensor numeric value.
HIERARCH ESO INS TEMP3 ID    = 'TMUSP   '   / Temperature sensor ID.
HIERARCH ESO INS TEMP3 NAME  = 'UVB spectro. temp.' / Temperature sensor name.
HIERARCH ESO INS TEMP3 VAL   =      32.550 / Temperature sensor numeric value.
HIERARCH ESO INS TEMP4 ID    = 'TMUCR   '   / Temperature sensor ID.
HIERARCH ESO INS TEMP4 NAME  = 'UVB cryo. temp.' / Temperature sensor name.
HIERARCH ESO INS TEMP4 VAL   =     -21.700 / Temperature sensor numeric value.
HIERARCH ESO INS TEMP5 ID    = 'TMVSP   '   / Temperature sensor ID.
HIERARCH ESO INS TEMP5 NAME  = 'VIS spectro. temp.' / Temperature sensor name.
HIERARCH ESO INS TEMP5 VAL   =      32.460 / Temperature sensor numeric value.
HIERARCH ESO INS TEMP6 ID    = 'TMVCR   '   / Temperature sensor ID.
HIERARCH ESO INS TEMP6 NAME  = 'VIS cryo. temp.' / Temperature sensor name.
HIERARCH ESO INS TEMP6 VAL   =         nan / Temperature sensor numeric value.
HIERARCH ESO INS TEMP7 ID    = 'TMNCR   '   / Temperature sensor ID.
HIERARCH ESO INS TEMP7 NAME  = 'NIR cryo. temp.' / Temperature sensor name.
HIERARCH ESO INS TEMP7 VAL   =         nan / Temperature sensor numeric value.
HIERARCH ESO INS TEMP8 ID    = 'TCAB1   '   / Temperature sensor ID.
HIERARCH ESO INS TEMP8 NAME  = 'Cabinet Temp. #1' / Temperature sensor name.
HIERARCH ESO INS TEMP8 VAL   =         nan / Temperature sensor numeric value.
HIERARCH ESO INS TEMP80 ID   = 'OBCT    '   / Temperature sensor ID.
HIERARCH ESO INS TEMP80 NAME = 'OB Cover Tel. Side' / Temperature sensor name.
HIERARCH ESO INS TEMP80 VAL  =     107.890 / Temperature sensor numeric value.
HIERARCH ESO INS TEMP81 ID   = 'OBCB    '   / Temperature sensor ID.
HIERARCH ESO INS TEMP81 NAME = 'OB Cover Tank Side' / Temperature sensor name.
HIERARCH ESO INS TEMP81 VAL  =     108.010 / Temperature sensor numeric value.
HIERARCH ESO INS TEMP82 ID   = 'OBPR    '   / Temperature sensor ID.
HIERARCH ESO INS TEMP82 NAME = 'OB Prism1'  / Temperature sensor name.
HIERARCH ESO INS TEMP82 VAL  =     107.960 / Temperature sensor numeric value.
HIERARCH ESO INS TEMP83 ID   = 'OBCL    '   / Temperature sensor ID.
HIERARCH ESO INS TEMP83 NAME = 'OB Corrector Lens' / Temperature sensor name.
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HIERARCH ESO INS TEMP83 VAL  =      108.210 / Temperature sensor numeric value.
HIERARCH ESO INS TEMP84 ID   = 'CP       '   / Temperature sensor ID.
HIERARCH ESO INS TEMP84 NAME = 'Cryostat Cold Plate' / Temperature sensor name.
HIERARCH ESO INS TEMP84 VAL  =       89.573 / Temperature sensor numeric value.
HIERARCH ESO INS TEMP85 ID   = 'RS       '   / Temperature sensor ID.
HIERARCH ESO INS TEMP85 NAME = 'Cryo. rad. shield' / Temperature sensor name.
HIERARCH ESO INS TEMP85 VAL  =      103.910 / Temperature sensor numeric value.
HIERARCH ESO INS TEMP86 ID   = 'DCB      '   / Temperature sensor ID.
HIERARCH ESO INS TEMP86 NAME = 'Detector Copper bar' / Temperature sensor name.
HIERARCH ESO INS TEMP86 VAL  =       78.260 / Temperature sensor numeric value.
HIERARCH ESO INS TEMP87 ID   = 'OBGR     '   / Temperature sensor ID.
HIERARCH ESO INS TEMP87 NAME = 'OB Grating' / Temperature sensor name.
HIERARCH ESO INS TEMP87 VAL  =       28.000 / Temperature sensor numeric value.
HIERARCH ESO INS TEMP9 ID    = 'TCAB2    '   / Temperature sensor ID.
HIERARCH ESO INS TEMP9 NAME  = 'Cabinet Temp. #2' / Temperature sensor name.
HIERARCH ESO INS TEMP9 VAL   =          nan / Temperature sensor numeric value.
HIERARCH ESO INS TEMP90 ID   = 'NHT      '   / Temperature sensor ID.
HIERARCH ESO INS TEMP90 NAME = 'NIR Head Temp.' / Temperature sensor name.
HIERARCH ESO INS TEMP90 VAL  =       80.000 / Temperature sensor numeric value.
HIERARCH ESO INS TILT1 BEGINX=      -4.8460 / Position at start in X [marcsec].
HIERARCH ESO INS TILT1 BEGINY=       1.6850 / Position at start in Y [marcsec].
HIERARCH ESO INS TILT1 ENDX  =      -4.8460 / Position at stop in X [marcsec].
HIERARCH ESO INS TILT1 ENDY  =       1.6850 / Position at stop in Y [marcsec].
HIERARCH ESO INS TILT1 ID    = 'afcs1    '   / AFCS ID.
HIERARCH ESO INS TILT1 MODE  = 'AUTO     '   / AFCS mode.
HIERARCH ESO INS TILT1 NAME  = 'Flexure comp. UVB' / AFCS description.
HIERARCH ESO INS TILT1 POSX  =      -4.8410 / Current position in X [marcsec].
HIERARCH ESO INS TILT1 POSY  =       1.6910 / Current position in Y [marcsec].
HIERARCH ESO INS TILT2 BEGINX=      -1.7550 / Position at start in X [marcsec].
HIERARCH ESO INS TILT2 BEGINY=      -0.2320 / Position at start in Y [marcsec].
HIERARCH ESO INS TILT2 ENDX  =      -1.7550 / Position at stop in X [marcsec].
HIERARCH ESO INS TILT2 ENDY  =      -0.2320 / Position at stop in Y [marcsec].
HIERARCH ESO INS TILT2 ID    = 'afcs2    '   / AFCS ID.
HIERARCH ESO INS TILT2 MODE  = 'AUTO     '   / AFCS mode.
HIERARCH ESO INS TILT2 NAME  = 'Flexure comp. VIS' / AFCS description.
HIERARCH ESO INS TILT2 POSX  =      -1.7500 / Current position in X [marcsec].
HIERARCH ESO INS TILT2 POSY  =      -0.2260 / Current position in Y [marcsec].
HIERARCH ESO INS TILT3 BEGINX=      -1.8030 / Position at start in X [marcsec].
HIERARCH ESO INS TILT3 BEGINY=      -0.2760 / Position at start in Y [marcsec].
HIERARCH ESO INS TILT3 ENDX  =      -1.8030 / Position at stop in X [marcsec].
HIERARCH ESO INS TILT3 ENDY  =      -0.2760 / Position at stop in Y [marcsec].
HIERARCH ESO INS TILT3 ID    = 'afcs3    '   / AFCS ID.
HIERARCH ESO INS TILT3 MODE  = 'AUTO     '   / AFCS mode.
HIERARCH ESO INS TILT3 NAME  = 'Flexure comp. NIR' / AFCS description.
HIERARCH ESO INS TILT3 POSX  =      -1.7970 / Current position in X [marcsec].
HIERARCH ESO INS TILT3 POSY  =      -0.2620 / Current position in Y [marcsec].
HIERARCH ESO OBS DID         = 'ESO-VLT-DIC.OBS-1.11' / OBS Dictionary
HIERARCH ESO OBS GRP         = '0        '   / linked blocks
HIERARCH ESO OBS ID          =           -1 / Observation block ID
HIERARCH ESO OBS NAME        = 'Maintenance' / OB name
HIERARCH ESO OBS PI-COI ID   =            0 / ESO internal PI-COI ID
HIERARCH ESO OBS PI-COI NAME = 'Condor   '   / PI-COI name
HIERARCH ESO OBS PROG ID     = 'Maintenance' / ESO program identification
HIERARCH ESO OBS START       = '2008-05-07T16:09:06' / OB start time
HIERARCH ESO OBS TPLNO       =            1 / Template number within OB
HIERARCH ESO OCS DET2 IMGNAME= 'SHOOT_SLT_OBJ_VIS' / Data File Name.
HIERARCH ESO OCS SYNC        =            F / Synchronous exposures flag
HIERARCH ESO SEQ ARM         = 'VIS      '   / Instrument Arm
HIERARCH ESO TPL DID         = 'ESO-VLT-DIC.TPL-1.9' / Data dictionary for TPL
HIERARCH ESO TPL EXPNO       =            3 / Exposure number within template
HIERARCH ESO TPL ID          = 'SHOOT_slt_obs_Stare' / Template signature ID
HIERARCH ESO TPL NAME        = 'SHOOT stare observations' / Template name
HIERARCH ESO TPL NEXP        =            4 / Number of exposures within templa
HIERARCH ESO TPL PRESEQ      = 'SHOOT_obs_Stare' / Sequencer script
HIERARCH ESO TPL START       = '2008-05-07T16:09:06' / TPL start time
HIERARCH ESO TPL VERSION     = '$Revision: 1.28 $' / Version of the template
INHERIT =                    T          / denotes the INHERIT keyword conventio
END
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12 Log files

12.1 Operational Logs (FITS format)

No special Operational Logs are implemented, apart from the standard provided by Bob, BOSS and ICS.

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